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GRASS
VARIETIES
IN THE



BY

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GRASS VARIETIES IN THE UNITED STATES^{1/} 2/

952845

This catalog of grass varieties has been prepared for the convenience of workers cooperating in the evaluation of grasses for forage, fine turf, and soil conservation purposes. It should serve as a useful guide to the origin and present status of the principal named varieties and experimental strains that have been distributed for testing in the United States.

Most of our major grasses have been introduced -- a process that started with early pioneer settlements along the borders of what is now the continental United States. Chance introductions were followed in time by organized plant explorations sponsored by the U. S. Department of Agriculture, as well as by the direct exchange of seed and plant material between American and foreign research workers. It would be impracticable to attempt to list all of the organizations and individuals who have participated in bringing promising new grasses and grass varieties to the United States. However, one would be remiss, indeed, if he failed to acknowledge the exploration work conducted by the former Division of Plant Exploration and Introduction of the United States Department of Agriculture. In addition, special mention should be made of the early and effective introduction programs conducted by several State Agricultural Experiment Stations, particularly those in California, Florida, and Texas.

Certain individuals, by virtue of their professional stature and personal contacts, did much to bring new grasses to the United States and to encourage their evaluation. Leaders in this field include: C. V. Piper, H. N. Vinall, and G. E. Ritchey of the former Bureau of Plant Industry;

1/ This is an interim report and certain statements may be modified when the catalog is revised. The publication, display, or distribution of descriptions that have not appeared previously in published form is prohibited without prior written approval of the Crops Research Branch, Agricultural Research Service, U. S. Department of Agriculture, and the cooperating agency or agencies concerned.

2/ Selected common names defined in the "Rules and Regulations under the Federal Seed Act," U.S.D.A., A.M.S. Service and Regulatory Announcements No. 156 (reprinted with amendments, August 1956) are listed below, with alternative names as used in this report appearing in parentheses.

- Bermuda-grass (bermudagrass)
- Mountain Brome (mountain bromegrass)
- Smooth Brome (smooth bromegrass)
- Side-oats Grama (sideoats grama)
- Yellow indiangrass (indiangrass)
- Crested or Fairway crested wheatgrass (fairway wheatgrass)
- Canada Wild-rye (Canada wildrye)
- Russian Wild-rye (Russian wildrye)

and C. R. Enlow and F. J. Crider of the former Nursery Division of the Soil Conservation Service.

Significant contributions have been made in breeding improved grass varieties, but by and large, the accumulation of information basic to effective grass breeding work has scarcely begun.

Introductions are frequently grown at more than one Experimental Station, and hence it is frequently difficult to assign credit to any one individual or group. Insofar as possible, an attempt has been made to recognize those individuals and agencies that have taken the initiative in increasing and distributing specific strains. However, the accuracy and completeness of these descriptions is limited by the information that was available.

Brief descriptions of several foreign varieties that have been distributed rather widely for testing purposes have been included. "Breeder seed" has been defined by seed certification agencies and is a term used by plant breeders in various ways, but for the purpose of this catalog, it serves only to indicate the source of stock seed.

No attempt has been made to appraise the relative merits of the grass varieties included in this report. Several of the varieties are obsolete and some have failed to exhibit any particular promise in comparative tests. Nevertheless, the names and numbers identifying these varieties appear in the literature, so that some information as to their origin and current status will be available in a readily accessible form.

The most effective system for maintaining the characteristics of a grass variety in commercial seed production is seed certification. Many grass varieties should be certified on a limited generation basis. The practice of continuing varieties by recertifying certified seed indefinitely can lead to serious changes in type. The originating or sponsoring station and the certifying agency must assume the obligation for developing production practices and adequate control measures for the maintenance of a given variety.

The author would appreciate receiving any suggestions that would add to the accuracy and value of this report. Particular attention should be given to submitting; (a) supplementary information on varieties described in the catalog, and (b) descriptive material or suggestions for other varieties that should be included. Comments should be submitted before July 1, 1958.

The cooperation of grass specialists associated with the State Agricultural Experiment Stations, the Agricultural Research Service, U.S.D.A., and the Soil Conservation Service, U.S.D.A., in submitting material for this report is gratefully acknowledged. Special recognition is given to Mrs. W. Maxine Ramer for her enthusiasm and ingenuity in preparing the report for multilithing.



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Agropyron cristatum (L.) Gaertn., fairway wheatgrass.

A-1770

Increased at the SCS Nursery, Albuquerque, New Mexico -- C. G. Marshall and J. A. Downs.

Source: Collected on dry gravelly soil near Ankara, Turkey. Westover-Enlow Expedition 1934. Introduced as P.I. 109,012.

Description: A rhizomatous strain that might be regarded as another species. Plants and spikes smaller than typical fairway wheatgrass. Plants 20-40 cm. high, spikelets scarcely 0.5 mm (approximately). Rhizomes freely developed though plants appear densely tufted.

Released: No, included in regional testing program.

Breeder seed: None, old seed in storage.

Nebraska 3576

Developed at the Nebraska Agricultural Experiment Station, Lincoln, Nebraska, in cooperation with the Agricultural Research Service and Soil Conservation Service, U. S. D. A. -- L. C. Newell.

Source: Commercial lots and Experiment Station accessions of fairway wheatgrass collected in 1936-1938.

Method of selection: Selection of space-planted clones was carried on through three successive generations. Seed from the superior plants was composited and increased.

Description: An early maturing cool-season grass. The variety is very leafy and productive of both forage and seed. In comparative tests at Lincoln, Nebraska, it has produced forage yields equal to Nordan. No evaluation has been made as to its value as pasture. Sod production indicates its possible utilization for turf purposes.

Released: No, included in regional testing program.

Breeder seed: Nebraska Agricultural Experiment Station, Lincoln, Nebraska.

Turkish (Cresturk)

Increased by the U. S. Southern Great Plains Field Station, Woodward, Oklahoma and the Oklahoma Agricultural Experiment Station, Stillwater, Oklahoma -- J. R. Harlan and W. R. Kneebone.

Source: Four source selections (PI 172,690; 172,691; 172,694 and 180,794) collected in Turkey by J. R. Harlan in 1948.

Method of breeding: Seed collected from planting made in 1950 at Woodward, was seeded in separate rows at El Reno in fall of 1952. Although rows have been kept separate, a considerable number of volunteer plants appear each year and the original identity of the several strains is probably lost. Seed from these 4 sources was bulked for further increase.

Description: Material as a whole is very leafy and has looked good under irrigation. Dryland seedlings to date has been disappointing in Oklahoma and the strain may not be adapted so far south.

Released: No, included in regional testing program as Turkish fairway wheatgrass, and has been tested under the name Cresturk.

Breeder seed: Oklahoma Agricultural Experiment Station, Stillwater, Oklahoma.

Agropyron dasystachyum (Hook.) Scribn., thickspike wheatgrass.

P-1822

Selected at the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington -- John L. Schwendiman.

Source: Native vegetation east of the Dalles, Oregon.

Method of breeding: Selected by elimination of aberrant plants during several generations. Bulked selections increased under isolation.

Description: A vigorous, blue, leafy rapid spreading productive strain. Foliage and culms glaucous with only partial pubescence on the lemmas. Seed production is fair to good, produces some sterile florets, shows some resistance to leaf and stem rust. Chromosome number in $2n = 28$. Well adapted to conservation use on light textured soils in wind erosion areas.

Released: No.

Breeder seed: Available from the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington.

Agropyron desertorum (Fisch.) Schult., crested wheatgrass.

Mandan 2194B

Selected at U. S. Northern Great Plains Field Station, Mandan, North Dakota -- George A. Rogler.

Source: 2-clone synthetic, one clone selected from an old nursery at Dickinson, North Dakota and the other clone an early large-seeded selection made by J. T. Sarvis.

Method of breeding: Each clone selected on the basis of polycross progeny performance.

Description: Uniform, tall, erect plants, compact heads with large awnless seed; high seed producer.

Released: No, included in regional grass testing program.

Breeder seed: U. S. Northern Great Plains Field Station, Mandan, North Dakota.

Mandan 2359

Selected at U. S. Northern Great Plains Field Station, Mandan, North Dakota -- George A. Rogler.

Source: Synthetic of three early clones selected by J. T. Sarvis.

Method of breeding: Parental clones selected on the basis of polycross progeny tests.

Description: Uniform, tall, erect plants, compact heads with large awnless seed, good seed producer.

Released: No, included in regional testing program.

Breeder seed: U. S. Northern Great Plains Field Station, Mandan, North Dakota.

Nebraska 10

Developed at the Nebraska Agricultural Experiment Stations in cooperation with the SCS and the ARS, U.S.D.A., -- E. C. Conard.

Source: An accession obtained by the SCS Nursery from an unknown commercial source.

Method of selection: Repeated plantings of Nebraska 1007 proved this lot to have superior seedling vigor and stand establishment as compared with other seed lots. The seed was later increased by the SCS Nurseries and the Nebraska Agricultural Experiment Station, as Nebraska 10.

Description: A vigorous, productive, early maturing strain of crested wheatgrass, exhibiting various spike types predominantly of the standard type. In comparative tests of forage yield, the strain has been widely adapted and has compared favorably in yield with leading standard strains. It is considered of considerable potential value for selection because of its diversity of plant types.

Released: No, included in regional grass program.

Foundation seed: Maintained by the Foundation Seed Division, Department of Agronomy, Nebraska Agricultural Experiment Station, Lincoln, Nebraska.

Nordan

Selected at U. S. Northern Great Plains Field Station, Mandan, North Dakota -- George A. Rogler.

Source: Developed from a selection made in old nursery at Dickinson, North Dakota Station in 1937.

Method of breeding: Single plant selections made under open-pollination for two generations -- 7 plants within an open-pollinated progeny bluked for increase and testing as Mandan 571.

Description: More uniform and erect than commercial, seed more awnless and larger in size, heads more dense and compressed, good seedling vigor and seed quality. Forage yield as good or better than commercial.

Released: 1953, cooperatively by the North Dakota Agricultural Experiment Station, and the Crops Research Division, ARS.

Breeder seed: U. S. Northern Great Plains Field Station, Mandan, North Dakota.

Certified seed: Available in quantity.

S. D. 15

Selected at South Dakota Agricultural Experiment Station, Brookings, South Dakota -- James G. Ross.

Source: Original selections from adapted materials collected from old fields in South Dakota.

Method of breeding: Sibbing within an outstanding open-pollinated progeny was carried out. From these progenies, individuals were selected on the basis of greenhouse root rot-tests. From polycross progeny tests selections on the basis of forage and seed production evaluations, were made. This strain is produced from a synthetic of three of these selected genotypes.

Description: This strain is upright and very leafy. It has awnless spikelets with longer rachis internodes than the common A. desertorum.

Released: No, included in regional testing program.

Breeder seed: South Dakota Agricultural Experiment Station, Brookings, South Dakota.

Summit

Selected at Dominion Forage Crops Laboratory, Saskatoon, Saskatchewan. --
R. P. Knowles.

Source: Introduction from Western Siberian Experiment Station, Omsk, received
in 1927.

Description: Fairly similar to Standard crested wheatgrass strains grown in the
United States. No attempt made to alter strain through selection, but one generation
of increase was by single plants to rogue out impurities, particularly fairway
type plants. Tested as S-131.

Released: Canada Department of Agriculture.

Breeder seed: Forage Crops Laboratory, Saskatoon, Saskatchewan.

Certified seed: Available.

Utah 42-1

Selected at the Utah Agricultural Experiment Station, Logan, Utah, ARS, U.S.D.A.,
cooperating -- Wesley Keller.

Source and Method of breeding: This strain originated from 30 plants selected
in 1948 from an old field in the hills between Cache and Box Elder Counties in
Northern Utah. These plants were tall, leafy, and dark-green in appearance.
After their transfer to the Forage Experiment Farm at Logan, Utah, nine plants
were discarded and the remaining 21 plants were cloned into 20 pieces and allowed
to interpollinate to produce Breeder seed of this strain.

Description: Tall, erect with considerable variation with respect to spike
characteristics. Good forage yield but relatively low seed yield.

Released: No, included in regional testing program. Original clones have been
discarded and are no longer maintained. Limited amount of seed in storage.

Certified seed: None.

Agropyron elongatum (Host) Beauv., tall wheatgrass.

A-1876 (P.I. 109,452)

Increased at SCS Nursery, Albuquerque, New Mexico, as A-1876, and at the Utah
Agricultural Experiment Station, Logan, Utah; ARS, U.S.D.A., cooperating, as
P.I. 109,452.

Source: P.I. 109,452, Westover-Enlow, Bandirma, Turkey.

Method of breeding: Bulk increase.

Description: Tall perennial bunchgrass that is widely used in reclaiming saline
soils. Good seed producer, and forage yields are higher than any other accession
tested at Albuquerque, New Mexico.

Released: 1937, cooperatively by the New Mexico Agricultural Experiment Station
and the Nursery Division, SCS. Included in regional grass tests as Utah 109,452.

Breeder seed: SCS-New Mexico Cooperative Nursery.

Certified seed: None. (Probably certified as tall wheatgrass only).

Nebraska 98526

Increased in SCS Nurseries in cooperation with the Nebraska Agricultural Experiment Station, Lincoln, Nebraska. Tested as Nebraska 1978 at SCS Nurseries.

Source: P.I. 98,526, originally grown at the Colorado Experiment Station, Ft. Collins, Colorado, and later distributed to nurseries in the Dakotas and Nebraska (1936) by the SCS. P.I. 98,526 was originally introduced into the United States from Russia in 1932.

Method of breeding: Direct increase of P.I. 98,526 without selection.

Description: Tall wheatgrass is an erect, tall, somewhat coarse bunchgrass with deeply veined, bluish-green leaves and coarse stems. It is particularly well-adapted to low wet or alkaline soil conditions where it produces good yields. It also does very well in dry, upland plantings, where it appears moderately drought resistant. P.I. 98,526 is a relatively leafy type somewhat less aggressive and coarse than Turkish introductions with which it has been compared.

Released: First grown on Nebraska farms for seed production under field certification by the Nebraska Crop Improvement Association on the recommendation of the Nebraska Agricultural Experiment Station, and the SCS and the ARS of the U.S.D.A.

Certified seed: Available. Certified as Nebraska 98,526.

P-2326

Selected at the Plant Materials Center, Soil Conservation Service, U.S.D.A., Pullman, Washington - J. L. Schwendiman.

Source: Selection from P. I. 98526 introduced from USSR in 1934.

Method of breeding: Mass selection from spaced plants of above introduction.

Description: Tall very late maturing, stemmy, bunch type wheatgrass. Coarse blue-green leaves, large seeded, good seedling vigor. Very tolerant to wet alkaline conditions and semi-arid regions of the West at 4,500 up to 6,000 feet elevation. It is fairly palatable and highly productive on sub-irrigated and irrigated saline, and alkali land. It is used to reclaim non-productive saline and alkali lands. This strain is distinct from P-5330 (P.I. 119,603).

Released: 1951, under accession P-2326 for certified seed production in Idaho.

Breeder seed: Plant Materials Center, SCS-USDA, Pullman, Washington.

Certified seed: Available.

Agropyron inerme (Scribn. & Smith) Rydb., beardless wheatgrass.

Whitmar

Selected at the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington -- J. L. Schwendiman.

Source: Collected from the native Palouse prairie grassland climax near Colton, Whitmar County, Washington by L. A. Mullen in an area of 20 inches of annual precipitation at an elevation of 2800 feet on Palouse silt-loam soil.

Method of breeding: First observed as an outstanding accession, P-3537, in observational tests among more than 500 beardless and bluebunch wheatgrass collections from the Pacific Northwest that represented 6 ecotypes. Developed by selection from a spaced-planted nursery.

Description: A long-lived, native, perennial, drought resistant bunchgrass. Intermediate type with moderately abundant erect to semi-erect, medium coarse stems and abundant, soft, lax, flat basal and cauline leaves. Seeds are awnless but short-awned seeds occur occasionally.

Seedling vigor is good. Seed and forage production are high. It has good spring and fall recovery and retains its feed value and palatability late into the summer.

Released: 1946, by the Washington, Idaho and Oregon Agricultural Experiment Stations, and the Plant Materials Centers, SCS, U.S.D.A., at Pullman, Washington and Aberdeen, Idaho.

Breeder seed: Plant Materials Center, SCS, U.S.D.A., Pullman, Washington.

Certified seed: Available.

Agropyron intermedium (Host) Beauv., intermediate wheatgrass.

A-12496

Increased at the Soil Conservation Service Nursery, Albuquerque, New Mexico -- C. G. Marshall and J. A. Downs; and at the Utah Agricultural Experiment Station, Logan, Utah; Agricultural Research Service, U.S.D.A., cooperating -- Wesley Keller.

Source: P.I. 98,568 Maikop, Russia -- increased at the Utah A.E.S.

Description: Variable, but not as mixed as many introductions. Good vigor and development at Albuquerque, New Mexico and at Logan, Utah. Produced in quantity at former S.C.S. Nursery at Albuquerque.

Released: No, seed distributed to S.C.S. cooperators. Included in regional grass tests.

Breeder seed: S.C.S.-N.M. Cooperative Nursery.

Certified seed: None.

Amur

Selected at SCS Nursery, Albuquerque, New Mexico.

Source: PI 131,532 Manchuria. Received as Agropyron amurense from Pullman SCS Nursery, P-9838. Identified by J. R. Swallen as A. intermedia. Tested as A-13,016.

Method of breeding: Awned type plants rogued from original material. Bulk increased.

Description: Uniform gray green. Stronger seedling vigor than other intermediate wheatgrasses. Heavy seed producer and does not get sod bound or fall off in seed production as rapidly as commercial.

Released: 1952, in cooperation with New Mexico Agricultural Experiment Station, State College, New Mexico.

Breeder seed: SCS-N.M. Cooperative Nursery, fall '58, and Plant Materials Center, Pullman, Washington

Certified seed: Available. (Certified in Colorado and Nebraska.)

Greenar

Selected at the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington -- John L. Schwendiman.

Source: Developed from a selection made in 1937 from PI 98,568 which was introduced by Westover-Enlow from the USSR in 1934.

Method of breeding: Open-pollinated selections were made from planting one generation after the introduction. Aberrant plants were removed in following generation. Selections were bulked and increased for field testing as P-2327.

Description: A vigorous, mild sod-forming, late-maturing, leafy, dark-green, broad-leaved, high-producing wheatgrass. Plants are variable but over 90 percent green in color. Some plants, less than 5 percent, show a trace of pubescence. Spring recovery is early and abundant; fall recovery is good; plants are disease resistant, very productive and aggressive. Widely adapted for conservation plantings on well-drained soils in dryland and irrigated areas. Suitable for both hay and pasture seedings made alone or with alfalfa.

Released: 1945, under the number P-2327 cooperatively by the Washington, Idaho, and Oregon Agricultural Experiment Stations, and the Plant Materials Centers, SCS, U.S.D.A., at Pullman, Washington and Aberdeen, Idaho. Named Greenar in 1956.

Breeder seed: Plant Materials Center, SCS, U.S.D.A., Pullman, Washington.

Certified seed: Available in quantity.

Idaho Synthetic 3

Selected at Idaho Agricultural Experiment Station, Moscow, Idaho -- C. L. Canode.

Source: Selections from Greenar (P-2327).

Description: A seven clone synthetic comprised of plants that are predominately green in color. Plants selected for less vigor of rhizome spread, increased seed yield, awlessness and freedom from pubescence on the lemmas.

Released: No, included in regional testing program.

Breeder seed: Idaho Agricultural Experiment Station, Moscow, Idaho.

Idaho No. 4

Selected at the Idaho Agricultural Experiment Station, Moscow, Idaho -- C. L. Canode.

Source: Selections from Greenar (P-2327).

Description: A nine clone synthetic. Plants selected for color, leafiness, a mild sod forming characteristic and increased seed yield. The lemmas are mostly free of pubescence and are practically awnless.

Released: No, included in regional grass tests.

Breeder seed: Idaho Agricultural Experiment Station.

Iowa M2-10820

Selected at the SCS Nursery, Ames, Iowa -- M. E. Heath and A. I. Alcott.

Source: Original seed came from SCS Nursery at Lincoln, Nebraska (Nebraska-2947) in 1941 which traces back to the introduction, P.I. 98,568.

Method of breeding: Seed was saved from a number of glaucous, bluish-green plants in 1943, planted, and the first increase harvested in 1945. Subsequently, several additional generations of seed increase were made by SCS Nursery at Ames and Ankeny until 1953.

Description: Consists mostly of glaucous, bluish-green plants. Slightly earlier but otherwise similar in most respects to Nebraska 50, Lee and other strains originating from P.I. 98,568. Apparently, has no distinctly superior forage or seed traits to recommend it.

Released: No, entered in regional tests from 1952-1955.

Breeder seed: No longer available. Small increases made by SCS Nursery from 1945 to 1953.

Mandan 1274

Increased at the U. S. Northern Great Plains Field Station and the SCS Nursery, Mandan, North Dakota.

Source: P. I. 98,568 introduced from the USSR in 1932. This particular source traces to seed collected by Wayne Austin from Ft. Collins nursery in 1937.

Method of breeding: No breeding background; traces to same parental material as Ree.

Description: Types intergrading into pubescent wheatgrass, green and blugreen plants, highly variable.

Released: No official release but grown throughout Northern Great Plains.

Breeder seed: None.

Certified seed: Available in commercial quantities.

Nebraska 50

Selected at the Nebraska Agricultural Experiment Station, Lincoln, Nebraska; ARS, U.S.D.A., cooperating -- L. C. Newell.

Source: A selection from the increase of P.I. 98,568, originally grown at the Colorado Experiment Station and later distributed to nurseries in the Dakotas and Nebraska. The original introduction was from Maikop, USSR, in 1932.

Method of breeding: The selection of Nebraska 50 carried through three generations, 1941-1946, was directed toward the glaucous blue-green type with the elimination of the light green plants and the plants with pubescent lemmas. Seed of selected progenies with the desired characteristics were bulked in the third generation.

Description: Nebraska 50 maintains the excellent seed quality and seedling vigor of the common intermediate wheatgrass derived from P.I. 98,568, combined with a greater uniformity of the glaucous blue-green plant type. This type appears better adapted in tests in the southern range of adaptation of the grass than do the light green selections. Forage and seed yields of Nebraska 50 compare favorably in most tests with other strains.

Released: 1950, cooperatively by the Nebraska Agricultural Experiment Station and the Crops Research Division, ARS.

Foundation seed: Foundation Seed Division, Department of Agronomy, Nebraska Agricultural Experiment Station, Lincoln, Nebraska.

Certified seed: Available in quantity.

Ree

Developed at the South Dakota Agricultural Experiment Station, Brookings, South Dakota -- C. J. Franzke.

Source: Introduced as *Agropyron pungens* by the United States Department of Agriculture, Bureau of Plant Industry, from Leningrad, Russia, in April, 1932. It originated in the Maikop region of Russia at an elevation of 600 feet. Originally this introduction, number P.I. 98,568 was distributed by the United States Department of Agriculture to Dickinson and Mandan, North Dakota, in 1932, and to Fort Collins, Colorado; Pullman, Washington; Cheyenne, Wyoming; and Bozeman, Montana in 1935. Seed harvested from the Fort Collins, Colorado, planting was brought to the South Dakota Agricultural Experiment Station in the fall of 1937 by Wayne Austin of the SCS as *Agropyron pungens*. It was planted in the early fall of 1937 in an observational plot at the South Dakota Agricultural Experiment Station with several other known *Agropyron* species. It was discovered that this strain exhibited certain outstanding plant differences from known strains of

Agropyron pungens and Agropyron intermedium. Material of the strain collected in July, 1941, was classified by J. R. Swallen, United States Department of Agriculture, Bureau of Plant Industry, as derived from a cross of Agropyron intermedium and Agropyron trichophorum.

Method of breeding: This strain was released without selection from the original material grown at South Dakota State College.

Description: The plants vary in color from light green to dark green and many are covered with a whitish bloom. They are erect and are from 30 to 48 inches tall. The stems are compared with bromegrass are medium fine to large, coarse and leafy. They produce abundant basal leaves. The leaf blades are longer and broader in width than the leaves of bromegrass. The seed head or spike is erect to slightly nodding, lax and from 6 to 14 inches long.

The lemmas of some plants have pronounced awns, while those of others are awnless or practically so. The lemmas are sometimes pubescent. The seedlings have a characteristic reddish anthocyanin color which disappears when they become three or four weeks old. They are strong and large, resembling newly emerged winter rye seedlings. Yields of this grass in South Dakota are better than or equal to the best strains of bromegrass.

Released: 1945, by South Dakota Agricultural Experiment Station.

Breeder seed: South Dakota State College, Brookings, South Dakota.

Certified seed: Not available.

South Dakota 20

Selected at South Dakota State College, Brookings, South Dakota -- James G. Ross.

Source: Selected from Russian introduction P.I. 98,568 erroneously named Agropyron pungens obtained from Fort Collins in 1937. This was identified by Dr. J. R. Swallen, as being derived from a cross of Agropyron intermedium x A. trichophorum and was released in 1945 as Ree wheatgrass from the South Dakota Agricultural Experiment Station in 1945.

Method of breeding: Out of a nursery of selfed and open pollinated progenies, high seed setting plants were selected. On the basis of a diallel crossing system the best parents from the standpoint of forage and seed yield were selected. After two further polycross cycles, four genotypes were selected to make the synthetic South Dakota 20.

Description: Considerably higher seed production than Ree wheatgrass and somewhat higher yielding. It is uniform for a bluegreen plant color.

Released: No, included in regional testing program.

Breeder seed: South Dakota Agricultural Experiment Station, Brookings, South Dakota.

Agropyron riparium Scribn. & Smith, streambank wheatgrass.

Sodar

Selected at the Plant Materials Centers, SCS, U.S.D.A., Aberdeen, Idaho and Pullman, Washington -- R. H. Stark and J. L. Schwendiman.

Source: Collected from the native vegetation near Canyon City, Grant County, Oregon by R. G. Johnson in an area of 12-inch annual rainfall at an elevation of 3,000 feet.

Method of breeding: Best of 11 accessions. Improved by mass selection and elimination of aberrants during several generations at Plant Materials Center, SCS, U.S.D.A., Aberdeen, Idaho. Tested as P-2415.

Description: A drought-resistant, rhizomatous grass, particularly adapted for erosion control. Excellent seedling vigor, narrow, tough leaves. Produces open sod that is highly competitive to weeds and other plants under dryland conditions and offers excellent protection against soil erosion. Used primarily on roadsides, airports, and irrigation canal banks.

Released: 1954, cooperatively by the Idaho and Washington Agricultural Experiment Stations, and Plant Materials Centers, SCS, U.S.D.A., Aberdeen, Idaho and Pullman, Washington.

Breeder seed: Available from the Plant Materials Center, SCS, U.S.D.A., Aberdeen, Idaho.

Certified seed: Available.

Agropyron sibiricum (Willd.) Beauv., Siberian wheatgrass.

P-27

Selected at the Plant Materials Centers, SCS, U.S.D.A., Pullman, Washington and Aberdeen, Idaho -- J. L. Schwendiman and R. H. Stark.

Source: Original introduction in 1934 from Kasakstan, USSR, Institute Plant Industry, Leningrad, P.I. 108,434.

Method of breeding: Grown in row nurseries and field evaluation studies since 1935. Individual clones selected in 1949 by R. H. Stark are the basis of the present increase.

Description: Siberian is similar to standard crested wheatgrass, *A. desertorum* in adaptation and season of use but differs in several important respects. Narrow, awnless heads, fine, leafy stems. Drought resistant, good seedling vigor, and good seed yields. Well adapted to light, droughty soils.

Released: 1953, cooperatively by Idaho Agricultural Experiment Station and Aberdeen, Idaho, and Pullman, Washington, Plant Materials Centers, SCS, U.S.D.A.

Breeder seed: Plant Materials Center, SCS, U.S.D.A., Aberdeen, Idaho.

Certified seed: Available in quantity.

Agropyron smithii Rydb., western wheatgrass.

Mandan 456

Selected at U. S. Northern Great Plains Field Station, Mandan, North Dakota -- George A. Rogler.

Source: Field collection made at Mandan, North Dakota in 1939.

Method of breeding: Bulked seed of 13 clones originating within the progeny of a single selection from the above source. The 13 clones were selected for density of growth, leafiness, softness of leaves, and rust resistance.

Description: Vigorous, leafy, rust resistant.

Released: No, increased in 1941.

Breeder seed: Limited amount available at U. S. Northern Great Plains Field Station, Mandan, North Dakota.

Sand Strain

Increased at the U. S. Southern Great Plains Field Station, Woodward, Oklahoma.

Source: Clones collected by D. A. Savage from deep sands on the Range Unit near Fort Supply, Oklahoma, in 1940.

Released: No, distributed for testing under the name "Sand strain". Not impressive in most tests.

Breeder seed: not available.

Agropyron spicatum (Pursh) Scribn. & Smith, bluebunch wheatgrass.

P-739

Selected at the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington -- John L. Schwendiman.

Source: Collected in 1934 on Mallory Ridge, elevation 3,175 to 4,792 feet, Umatilla National Forest, Asotin County, Washington.

Method of breeding: First observed as a promising accession in nursery at Pullman, Washington which contained more than 500 Pacific northwest beardless and bluebunch wheatgrass collections representing six ecotypes. Developed by mass selection from spaced plantings.

Description: A long-lived native perennial; drought resistant; spreads slowly from short rhizomes. Leaves are abundant, erect to semierect, soft, lax, flat and primarily basal. Stems are moderately abundant, erect to semierect, and medium coarse. Seeds are large, heavy, and awned, and must be processed to permit satisfactory seeding. Best adapted at higher elevations where available moisture exceeds 8 inches, has good spring and fall recovery, and retains feed value and palatability late into the summer and fall.

Released: No, included in the field planting program of the SCS.

Breeder seed: Plant Materials Center, SCS, U.S.D.A., Aberdeen, Idaho.

Certified seed: Not available.

Agropyron trachycaulum (Link) Malte, slender wheatgrass.

Primar

Selected at the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington -- A. L. Hafnerichter, J. L. Schwendiman, and A. G. Law.

Source: Collected from the native vegetation near Beebe, Montana in 1933 by the Forest Service, U.S.D.A.

Method of breeding: Selected from the original collection, was assigned accession number P-2535, and tested with 104 other accessions.

Description: A vigorous, early growing, semi-erect, long-lived slender wheatgrass; usually 10 days earlier in seed maturity and 5-10 inches taller than late commercial strains; leaves and stems are moderately coarse and a glaucous grey-green in color; plants high in vegetative production, resistant to leaf rust, stem rust, and stripe rust and superior to common slender wheatgrass in resistance to head smut. Seed production is moderately heavy and seeds are relatively large when compared to ordinary strains. Adapted for use in sweetclover-grass conservation mixtures for pasture, hay, and green manure. Alkali tolerant and adapted to short-lived dryland seedlings in areas with a minimum of 14 inches of rainfall.

Released: 1946, cooperatively by Washington, Idaho, and Oregon Agricultural Experiment Stations; Plant Materials Center, SCS, U.S.D.A., Pullman, Washington; and the Crops Research Division, Agricultural Research Service.

Breeder seed: Plant Materials Center, SCS, U.S.D.A., Pullman, Washington.

Certified seed: Available in quantity.

Agropyron trichophorum (Link) Richt., pubescent wheatgrass.

A-1488

Source: Westover-Enlow, PI 107,328.

Method of breeding: None. Bulk production of outstanding accession in comparison rows at SCS Nursery, Albuquerque, New Mexico.

Description: Fairly uniform gray-green type. Good seed and forage producer. Gives good production and ground cover when planted in appropriate sites. Used as standard strain in range reseeding plots out of Albuquerque.

Released: Not released.

Breeders seed: SCS-N.M. Cooperative Nursery.

Mandan 759

Selected at U. S. Northern Great Plains Field Station, Mandan, North Dakota -- George A. Rogler.

Source: Increase of P.I. 116, 252 from the USSR in 1936.

Method of breeding: Progeny tests of original introduction.

Description: Higher forage and seed yields and greater persistence than other varieties of pubescent wheatgrass in tests at Mandan. Rapid spreader under favorable conditions. Some plants intergrade taxonomically into A. intermedium, but variety as a whole forms a more open sod than intermediate wheatgrass.

Released: No, included in regional testing program since 1955.

Breeder seed: U. S. Northern Great Plains Field Station, Mandan, North Dakota.

Certified seed: Limited quantities available at Ft. Lincoln Nursery, Bismarck, North Dakota.

Topar

Selected at the Plant Materials Center, SCS, U.S.D.A., -- John L. Schwendiman and Donald S. Douglas.

Source: PI-107,330, introduced from Tashkent, Turkestan in 1934 by the Westover-Enlow expedition.

Method of breeding: Developed by selection from a spaced planting. Selections bulked and increased under isolation. All testing prior to 1953 was as accession, P-41.

Description: A vigorous growing, late maturing, sod-forming, drought resistant wheatgrass. It resembles and is closely related to intermediate wheatgrass but is pubescent on the leaves, stems and lemmas. It is a more rapid sod-former and is adapted to lower fertility, higher elevations, and more alkaline sites than intermediate wheatgrass. Seedling vigor is very good. Seed production is moderate, seed does not shatter easily. Topar is adapted to shallow soils and low fertility sites in the 10-14 inch rainfall areas of the west.

Released: 1953, cooperatively by the Washington, Idaho, Oregon, and California Agricultural Experiment Stations, and the Plant Materials Centers, SCS, U.S.D.A., at Pullman, Washington; Aberdeen, Idaho; and Pleasanton, California.

Breeder seed: Plant Materials Center, SCS-U.S.D.A., at Pullman, Washington.

Certified seed: Available in quantity.

Utah 109

Selected at the Utah Agricultural Experiment Station, Logan, Utah; ARS, U.S.D.A., cooperating -- W. Keller.

Source: Seed obtained from the Intermountain Forest and Range Experiment Station, from old seed increase nursery on Experimental Farm, Logan, Utah.

Description: Strain increased on basis of its performance in six-year test. The replicated plot test included 47 strains of wheatgrass and bromegrass. Highly variable in many characters, it has blue-green, pubescent; green, pubescent; and blue-green, glabrous plants.

Released: No, included in regional grass tests.

Breeder seed: Utah Agricultural Experiment Station (limited to old seed).

Certified seed: Not available.

Agropyron trachycaulum x Hordeum jubatum L.

XAgrohordeum

Selected at the Utah Agricultural Experiment Station, Logan, Utah -- W. S. Boyle.

Source: Hybrid between Agropyron trachycaulum and Hordeum jubatum.

Method of breeding: Colchicine - induced allopolyploid from sterile, tetraploid hybrid between A. trachycaulum and H. jubatum. Selected for increased fertility.

Description: Tall, reasonably fertile hybrid. Information lacking on adaptation.

Released: No, included in regional tests.

Breeder seed: Utah Agricultural Experiment Station.

Agrostis palustris Huds., creeping bentgrass.

Penncross

Developed at the Pennsylvania Agricultural Experiment Station, University Park, Pennsylvania -- H. B. Musser.

Source: Parent strains for Penncross seed production are identified under the following Station accession numbers: 10(37)4 (Pennlri creeping bentgrass); 9(38)5 and 11(38)4.

Method of breeding: Penncross is the first generation seed produced by random crossing of three vegetatively propagated clones of creeping bentgrass.

Description: Turf quality records obtained over a five-year period at the Pennsylvania Agricultural Experiment Station show that Penncross is significantly better in density, in tolerance to disease, and in rate of recovery from attacks, than other commercially available seeded types. Because of its general vigor it shows exceptional ability to produce better turf than other seeded bents under adverse conditions. Recommended for golf course putting greens and similar intensive turfgrass areas.

Released: 1954, by Pennsylvania Agricultural Experiment Station.

Breeder seed: Parent clones maintained by Pennsylvania Agricultural Experiment Station, University Park, Pennsylvania.

Certified planting stock: Available.

Pennlu

Developed at the Pennsylvania Agricultural Experiment Station, University Park, Pennsylvania -- H. B. Musser.

Source: First observed at the Lulu Temple Golf Course in Philadelphia by Edward Roberts and Walter Groff. Sent to Pennsylvania Agricultural Experiment Station for evaluation by C. K. Hallowell. Tested under the accession number 10(37)4.

Description: Characteristics of the Pennlu strain that are chiefly responsible for its consistently good performance are high disease tolerance, good vigor, density and texture and ability to withstand a wide temperature range (high and low). Recommended for use on golf course greens and similar specialized turf.

Released: 1954, by Pennsylvania Agricultural Experiment Station.

Breeder seed: Maintained vegetatively at the Pennsylvania Agricultural Experiment Station, University Park, Pennsylvania.

Certified planting stock: Available.

Alopecurus arundinaceus Poir., creeping foxtail.

Garrison

Increased at the SCS Nursery, Mandan, North Dakota -- Jesse L. McWilliams.

Source: Field collection made near Max, McLean County, North Dakota in 1950. Information obtained from local people in the Max area indicate that this was brought into the area from eastern Germany or western Russia by one of the emigrants in the early days of homesteading. It has since escaped and is growing around many of the pothole sloughs in the area. In his "Handbook of North Dakota Plants", Dr. O. A. Stevens makes this statement regarding this grass, "Specimens were received in 1935 from Gust Steinhaus of Max, McLean County, and were identified by J. R. Swallen, who commented that it was the first record for the United States".

Description: Resembles common meadow foxtail *A. pratensis*, but has more vigorous rhizomes and broader leaves. Seed is black in color at maturity and spikelets fall away easily making seed harvest somewhat difficult. Has been field tested in mountain meadow areas of Montana and Wyoming and in wetland areas in North Dakota and South Dakota. Well adapted to wetland sites and produces good yields of high quality forage under these conditions. Tested as NDG-772.

Released: No, in SCS field evaluation trials.

Breeder seed: SCS Plant Materials Center, Bismarck, North Dakota.

Certified seed: None.

Selected at the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington -- J. L. Schwendiman.

Source: (P-111), PI-110,067, Botanic garden Alma-ata, USSR and (P-124), PI-110,351, Institute of Plant Industry, USSR, introduced by Westover-Enlow expedition in 1934.

Method of breeding: Selected plants from the original planting were cloned into a spaced, isolated, polycross nursery in 1948. F₂ seed was produced by open-pollination under isolation from other strains. A 1.8 acre planting was made in 1955 and F₃ seed was harvested in 1956.

Description: A leafy long-lived sod forming grass. Foliage is dark green, leaves are flat and mostly basal. Stems are erect, medium-coarse and abundant. Plants start growth early in the spring and mature seed early. Seeds are mostly black, short awned to awless, seed habits are fair. Seed ripens more uniformly than most strains. Seed shatters readily. Foliage stays green after seed matures and until heavy frost, or as long as moisture is available. It is best adapted to conservation plantings in wet or poorly drained areas.

Released: No, included in regional testing program in 1957-58 as P-111 x P-124, (F₃ seed).

Breeder seed: Plant Materials Center, SCS, U.S.D.A., Pullman, Washington.

Certified seed: Not available.

Andropogon annulatus Forsk., Diaz bluestem.

Pretoria 90

Increased former San Antonio SCS Nursery TX-N-1 -- James E. Smith, Jr. Called "Pretoria" to retain reference to general origin, and "90" (last two digits of accession number) to distinguish it from other South African accessions of A. annulatus.

Source: Introduced from Transvaal, South Africa as PI 188,926: BN-6730 and received April, 1951 from F. J. Crider as Dicanthium annulatum. Increased for testing as T-20,090.

Description: Selection of this strain was made on the basis of seedling vigor, rapid growth and aggressive spread by self-seeding, good seed production, and good drought tolerance. Plants are essentially bunchgrass, but stems will root to form a loose turf in contact with moist soil. Stems are leafy and the leaves carry high along the stems, which may reach a height of five feet at seed maturity. Green forage relished by cattle. Best use indicated as tame hay, pasture, and ensilage grown on heavy soils from about Temple, Texas south and eastward. Apparently cold-tolerant at Fort Stockton, San Angelo, Dublin and Palestine, but the area of full adaptation is not yet completely defined.

Released: Informally by SCS in 1954 for trials on cooperators' farms in soil conservation districts of southern and eastern Texas.

Breeder seed: Maintained at Plant Materials Center, San Antonio, Texas.

Certified seed: No (limited commercial production).

Andropogon caucasicus Trin., Caucasian bluestem.

Caucasian

Seed obtained in 1934 from A. E. Aldous, Kansas State College, and increased at the SCS Nursery, Manhattan, Kansas -- D. R. Cornelius and M. D. Atkins.

Source: Introduced from Tifflus, Caucasus, Russia in 1929 as PI No. 78,758. Increased for testing as KG-40.

Description: A bunchgrass with good leafiness, fine stems, and forage production approximately equivalent to native little bluestem at Manhattan. Free from disease. Seed maturity is indeterminant, very difficult to harvest, and total yield poor to fair. Palatability is lower than native bluestems, blue grama, and sideoats grama. Easily established and spreads well from seed. Good drought tolerance.

Released: Informally by SCS in 1946 for field evaluation plantings primarily in the mixed prairie area of central Kansas and western Oklahoma. Has come into rather extensive use in this area for warm-season tame grass pasture and for revegetating earth structures and other "sacrifice" areas. Is under grazing study at Fort Hays Experiment Station, Hays, Kansas.

Breeder seed: A foundation seed field is being maintained at the Plant Materials Center, Manhattan, Kansas.

Certified seed: None. (Seed is available commercially but many growers have dropped this species because of the difficulty of seed harvest).

Andropogon gerardii Vitman, big bluestem.

Kaw

Selected at Kansas Agricultural Experiment Station, Manhattan, Kansas; during the late 1930's and early 1940's.

Source: Composite of lines selected four or more generations from progeny of 200 accessions collected in 1935 in native Flint Hills grasslands south of Manhattan, Kansas.

Description: Tall and more uniformly leafy than field-run types; leafy, medium late in maturity, and somewhat resistant to rust. Its forage yields have been greater (in plot tests) than those of field-run accessions with which it has been compared. Seed yields relatively high and seed-set good.

Released: 1950, by the Kansas Agricultural Experiment Station.

Breeder seed: Kansas Agricultural Experiment Station, Manhattan, Kansas.

Certified seed: A small increase planting is being maintained at the Ashland Agronomy Farm (SCS Plant Materials Center), Manhattan, Kansas; and a number of Kansas Crop Improvement Association members are growers.

Andropogon hallii Hack., sand bluestem.

Woodward

Selected at the U.S. Southern Great Plains Field Station, Woodward, Oklahoma in cooperation with the Oklahoma Agricultural Experiment Station, Stillwater, Oklahoma -- J. R. Harlan and W. R. Kneebone.

Source: Traces to source nursery established by M. L. Peterson in 1942. Sources about equally divided between those in and near Woodward County and those in general vicinity of Clovis, New Mexico. Plants selected for high seed set and placed in six isolation blocks by J. R. Harlan: A short-early; short late; medium-early; medium-late; tall-early; and tall-late. Process repeated with separate populations established in 1946. Selected plants moved to six new isolation blocks. Seed from the two medium blocks lumped together and seeded for preliminary increase in 1949, refined somewhat by removal of excessively tall plants and today serves as breeder seed blocks of Woodward sand bluestem.

Description: A variable population but with most of the plants of a similar type. Superior to wild strains tested in (a) flower production, (b) seed set, (c) lack of excessively tall plants and (d) leafiness. Forage yield comparable to better source strains. Woodward can be combined reasonably well, and seed quality is superior to common sources.

Released: 1955, for seed increase -- cooperatively by the Oklahoma and Kansas Agricultural Experiment Station and the Crops Research Division, ARS.

Breeder seed: U.S. Southern Great Plains Field Station.

Certified seed: Available (in commercial production).

Andropogon ischaemum L., yellow bluestem.

A-1407

Increased at the SCS Nursery, Tucson, Arizona -- C. G. Marshall and L. P. Hamilton.

Source: Introduced from Russia as P.I. 107,017.

Description: A vigorous introduction that appears to be more erect and more cold hardy than King Ranch bluestem.

Released: No, has looked promising in central Arizona.

Breeder seed: Source material maintained at the Arizona Plant Materials Center, Tucson, Arizona.

A-14207

Increased at the SCS Nursery, Tucson, Arizona -- C. G. Marshall and L. P. Hamilton.

Source: Origin cannot be established, seed obtained from Texas as little bluestem. Looked promising in some Arizona plantings. Collected and sent to Tucson by Fred Lavin.

Description: Similar to A-1407 but appears to be superior in forage production. Panicle resembles that of Caucasian bluestem. Growth more erect than K-R bluestem.

Released: No.

Breeder seed: Maintained at Arizona Plant Materials Center, Tucson, Arizona.

El Kan

Selected at the SCS Nursery, Manhattan, Kansas -- Donald R. Cornelius.

Source: A seed collection made in 1937 from adventitious plants found growing in a county road ditch and the edge of adjoining rangeland west of Howard in Elk County, Kansas. Exact origin unknown but thought to have come in with cattle or hay movement from Texas.

Method of breeding: Selected in comparison with other introductions of this Asiatic bluestem. Tested as KG-495.

Description: One of the few strains of this species fully hardy to winter conditions in Kansas. A bunchgrass of medium leafiness and forage production more nearly equal to sideoats grama than to the native bluestems in eastern Kansas. Only fair seed production. Comparatively free from disease. Low in palatability compared with native bluestems, blus grama, and sideoats grama. Easily established and spreads well from seed.

Released: Informally by SCS for field evaluation plantings in western Kansas and Oklahoma and eastern Colorado and New Mexico. Primarily for use as a warm-season tame grass and for revegetating very difficult sites, earthen structures, and other "sacrifice" areas.

Breeder seed: A foundation seed field is being maintained at the Plant Materials Center, Manhattan, Kansas.

Certified seed: Not available.

Formosa

Increased at the Oklahoma Agricultural Experiment Station, Stillwater, Oklahoma; ARS, U.S.D.A., cooperating -- J. R. Harlan.

Source: Seed lot received in 1952 from Mr. Chu of Formosa. Two robust plants increased.

Description: Variety is of the sanguinica type of *B. ischaemum* and is a hexaploid. It differs from K.R. bluestem in being extremely leafy and rather late in blooming. Susceptible to leaf rust but not as much so as K. R. bluestem. It has overwintered at Stillwater, Oklahoma, but injury suggests a marginal adaptation in this respect. Strongly apomictic. Should be tested on good soils where high production and intensive management are anticipated.

Released: No, seed available for testing.

Breeder seed: Oklahoma Agricultural Experiment Station.

King Ranch

Selected at Kingsville, Texas by N. R. Diaz, then grown at San Antonio SCS Nursery

Source: Original seed collected from an area in a weakened Rhodesgrass pasture on the King Ranch where the escaped bluestem had gained dominance. Country of origin unknown, but thought by some to be China. Increased for testing as T-3487.

Description: KR bluestem is a mid-tall, perennial warm-season bunchgrass that forms semi-prostrate leafy clumps in early stages of growth. It is very drought tolerant, and is able to withstand winter temperatures as far north as central Oklahoma. Produces seed indeterminately throughout the season, volunteers aggressively, and tends to eliminate other competition. Adapted best for range seeding in clay soils and rocky, limestone hills. The forage is attractive to cattle and sheep, and plants can withstand heavy use for relatively long periods. Leaf growth is very susceptible to damage from leaf rust, especially in the spring. This weakness did not show up as a major factor until the grass had been in widespread use for a number of years.

Released: Informally by SCS about 1941. Later certified and formally released by SCS and TAES.

Breeder seed: Not available.

Certified seed: None (in commercial production).

King Ranch

The origin of King Ranch bluestem in America has been described by J. R. Harlan (Oklahoma Forage Leaflet No. 11, 1952) as follows: The material now generally in use was first noticed by Mr. Nico Diaz on the King Ranch, Texas, in 1937 and increased for distribution by the Soil Conservation Service under the number T-3487. Recent inquiry into the history of Texas yellow beardgrass, which is apparently indistinguishable from King Ranch bluestem in all respects, leaves little doubt as to the original entry of the grass into the United States. The history is briefly as follows:

January 11, 1917 - Received by Mr. P. B. Kennedy, California Agricultural Experiment Station, Berkeley, California, from Amoy, China. Presented by H. Hoyle Sink, American Counsellor, Amoy, China. Given the California number T. O. 144 and later the S.P.I. number 44096.

1924 - S.P.I. 44096 was introduced to the Angleton Experiment Station, Texas, by V. E. Hafner, Bureau Plant Industry, Washington, D.C., and given the Texas number T.S. 8413.

April 11, 1932 - T. O. 144 was received by the Div. Forage Crops and Diseases, Bureau Plant Industry, Washington, D. C., from the Agronomy Department, Univ. of California, Davis, California, and given the F.C. number 21785.

April 11, 1935 - F.C. 21785 was sent to B. F. Kiltz, Oklahoma A&M, Stillwater, Oklahoma, from Beltsville, Maryland.

1937 - F.C. 21785 was obtained by the U. S. Southern Great Plains Field Station, Woodward, Oklahoma, from Stillwater, Oklahoma.

1937 - F.C. 21785 was obtained by the Texas Agricultural Experiment Station College Station, Texas, from Woodward, Oklahoma.

1939 - T.S. 8413 was given the name yellow beardgrass in T.A.E.S. Bulletin No. 570 and its performance at Angleton described.

1949 - F.C. 21785 was given the name Texas yellow beardgrass and released for certification in Texas by the Texas Agricultural Experiment Station. All of the *A. ischaemum* material furnished by the T.A.E.S. to individuals or stations since 1941 originated from this source.

Since the original Chinese material had been grown at the Angleton Station as early as 1924, there is little reason to suppose that the King Ranch strain is any other than the Chinese accession that found its way from Angleton to the King Ranch sometime during the interval of 1924 to 1937.

Marash

Increased at the Oklahoma Agricultural Experiment Station, Stillwater, Oklahoma; ARS, U.S.D.A., cooperating -- J. R. Harlan.

Source: Collected by J. R. Harlan in Maras, Turkey in 1948 and introduced as P.T. 172,720.

Description: Belongs to common Eurasian type of *B. ischaemum* but is hexaploid rather than tetraploid, and considerably more robust than other accessions of this type. Variety resembles Elkan in general ecological behavior and gross appearance, and is also apomictic. It is larger, coarser, and more robust and bluish in color. Weedy, produces seed abundantly and continuously through growing season and should volunteer readily. Winter hardy in Oklahoma and resistant to leaf rust. It is a slow starter.

Released: No, seed available for testing.

Breeder seed: Oklahoma Agricultural Experiment Station, Stillwater, Oklahoma.

Andropogon nodosus (Willm.) Nash, angletongrass

Medio bluestem

Found as an escape by SCS personnel near Beeville, Texas. Named "Medio" bluestem by James E. Smith, Jr. because of the location where the grass was found.

Source: Medio Creek, Bee County, Texas near State Highway 202 bridge. This bluestem lines the lower benches of Medio Creek from a point near Berclair to Copano Bay, and has evidently been in place for many years. All other except woody vegetation has been excluded by the grass where it is established. Received February, 1951. Country of origin unknown. Increased for testing as T-20,011.

Description: Medio bluestem is a leafy, dark green, fine stemmed perennial form of Andropogon nodosus. It reproduces well by self-seeding, and spreads rapidly by means of prostrate stems to form a dense turf with upright stems about 30 inches tall at seed maturity. The grass is tolerant to alkaline soils, and low rainfall. It is a good seed producer and grows best in clay soils or sandy soils with a shallow clay layer. Capable of very high forage production. Both green and cured forage taken by cattle in preference to most native and other introduced grasses. Area of best adaptation appears to be east of San Angelo and south of Waco for pasture and range seeding.

This grass was apparently first noticed by Dick Senter of SCS about 1940. His attempts to reproduce it then were later reported as failures. In February, 1951, Simon E. Wolff of TX-N-1 SCS Nursery with Roy Boethel and Alfred Taylor of the Beeville SCS work unit collected five sod clumps which were brought to San Antonio by Wolff, divided and set out in two rod rows, and given accession number T-20011.

Released: Informally by SCS in 1954.

Breeder seed: Maintained at Plant Materials Center, San Antonio, Texas.

Certified seed: None (in commercial production).

Andropogon scoparius Michx., little bluestem.

KG 1580

Selected at the Kansas Agricultural Experiment Station, Manhattan, Kansas.

Source: Accessions collected in 1935 from the Flint Hills native grasslands south of Manhattan, Kansas. This strain is a composite of progeny of these accessions made after several generations of selection.

Description: Tall, leafy, vigorous, medium late in maturity, more uniform than field-run accessions. It is a high producer of forage and, under favorable conditions, also of seed. It carries a medium resistance to rust.

Released: Not released for certification.

Breeder seed: Kansas Agricultural Experiment Station, Manhattan, Kansas.

Certified seed: None.

Arrhenatherum elatius (L.) Presl, tall oatgrass.

Tualatin

Selected at the Oregon Agricultural Experiment Station, Corvallis, Oregon, Agricultural Research Service, U.S.D.A., cooperating -- H. A. Schoth.

Method of breeding: First selections made in 1930 in attempt to develop a strain for non-shattering seed characteristics.

Description: Leafier, finer stemmed, not quite as tall and about 10 days later in heading than common tall oatgrass. It is highly resistant to head smut which readily attacks the commercial type. Forage yields are equal under comparable growing conditions, and seed yields considerably higher, due to its resistance to shattering, than common tall oatgrass.

Released: Cooperatively by the Oregon Agricultural Experiment Station and the Crops Research Division, A.R.S. Seed distributed in 1940.

Breeder seed: Farm Crops Department, Oregon Agricultural Experiment Station, Corvallis, Oregon.

Certified seed: Available in quantity.

Bouteloua curtipendula (Michx.) Torr., sideoats grama

Butte

Developed at the Nebraska Agricultural Experiment Station in cooperation with the ARS and the SCS, U.S.D.A. -- E. C. Conard and L. C. Newell.

Source: Native collections from Holt and Platte counties, Nebraska.

Method of breeding: Repeated field plantings revealed the superiority of seedling vigor and establishment by native collections from Holt and Platte counties as compared with other sources. These collections were eventually combined and increased for further testing at Nebraska 37. Seed was distributed for testing in 1948.

Description: Winter hardy, long-lived, relatively early maturing variety of sideoats grama. The variety makes its best growth response under long days and is best adapted to areas with relatively short growing seasons. It has large caryopses and exhibits excellent seedling vigor for establishment. In eastern Nebraska it produces an excellent seed crop maturing in mid-August. It matures seed before frost in western Nebraska. In Nebraska it is recommended for upland plantings in the North Central and western districts.

Released: 1958, cooperatively by the Nebraska Agricultural Experiment Station, Crops Research Division, ARS, and Nursery Division, SCS.

Foundation seed: Foundation Seed Division, Department of Agronomy, Nebraska Agricultural Experiment Station, Lincoln, Nebraska.

Certified seed: None.

Coronado

Selected at the Southern Great Plains Field Station, Woodward Oklahoma in cooperation with the Oklahoma Agricultural Experiment Station -- J. R. Harlan.

Source: Field collection made by J. R. Harlan in 1946. Collected in small, dry wash 1.5 miles west of the town (Post office) of Encinoso, New Mexico.

Method of breeding: Increased at Woodward. Some plants died during the first two winters, but since that time no evidence of winter injury has been observed and it is presumed that non-hardy types have been eliminated. Seed distributed for testing under the name Encinoso.

Description: An apomictic type of sideoats grama. It is rather robust, productive of both forage and seed, and extremely uniform. Spikes tend to be straw colored at maturity and the tips of the inflorescences characteristically turn white as the spikes ripen. The seed is large; seed set under favorable conditions is good, and seedling vigor is excellent. Two crops of seed per year may be expected (as in most of the apomictic varieties).

Released: 1955, cooperatively by the Oklahoma Agricultural Experiment Station and the Crops Research Division, ARS.

Breeder seed: Oklahoma Agricultural Experiment Station.

Certified seed: Available.

El Reno

Selected at the SCS Nursery, Manhattan, Kansas -- Donald R. Cornelius.

Source: A field seed collection made by SCS on native prairie (Prison land) near El Reno, Oklahoma in 1934.

Method of breeding: Bulk material compared with many other collections at the Manhattan Nursery. Increased for testing as KG-482.

Description: Outstanding in leafiness, forage production, and vigor. Ranked well in disease resistance, seed production, and winter-hardiness. Has produced about 500 pounds of seed per acre under irrigation.

Released: 1944, cooperatively by the Kansas Agricultural Experiment Station, and the Nursery Division, SCS.

Breeder seed: A foundation seed field is maintained at the Plant Materials Center, Manhattan, Kansas.

Certified seed: Available. (Ample "affidavit" seed available. Most growers are not certifying because of rigid certification standards).

Trailway

Developed at the Nebraska Agricultural Experiment Station, Lincoln, Nebraska, in cooperation with the ARS and the SCS, U.S.D.A. -- L. C. Newell and E. C. Conard.

Source: A hybrid population of sideoats grama, found growing along an abandoned roadway in northern Holt county, Nebraska, by L. C. Newell in 1935.

Method of selection: Spaced plants of the collection were grown at the Nebraska Experiment Station. Selection was made in the hybrid population toward late maturity and freedom from rust. This selection was carried through three generations, resulting in the harvest and increase of seed from several groupings of selected clones. Seed from the several groups was later composited for seed increase and testing as Nebraska 52.

Description: A winter-hardy, long-lived, late-maturing variety of sideoats grama, comparable in growth type to more southerly varieties as to origin. It is somewhat indeterminate as to heading and flowering responses exhibiting considerable variability in maturity. It requires most of the growing season to mature seed in eastern Nebraska, and may fail to produce seed crops in regions with shorter seasons. In Nebraska it is recommended for upland plantings in the eastern and southern Districts.

Released: 1958, cooperatively by the Nebraska Agricultural Experiment Station, Crops Research Division, ARS and the Nursery Division, SCS.

Foundation seed: Foundation Seed Division, Nebraska Agricultural Experiment Station, Lincoln, Nebraska.

Certified seed: None.

Tucson:

Selected at the U.S. Southern Great Plains Field Station, Woodward, Oklahoma in cooperation with the Oklahoma Agricultural Experiment Station.

Source: Traces to field collection made near Douglas, Arizona by SCS. Reached Woodward by way of Lincoln, Nebraska in 1937.

Method of breeding: Considerable mortality and much winter injury observed in the population for first several years. Selection of surviving types resulted in material adequately hardy for most of Oklahoma.

Description: Consists of a group of apomictic clones that resemble each other very closely. Variety outstanding in ability to grow under hot, dry conditions and it remains green when most sexual types dry up. Two seed crops harvested each year, but it is inferior to Coronado in seed set, seed size and seedling vigor.

Released: Has become obsolete in Oklahoma with release of Coronado but is used elsewhere in the southwest.

Breeder seed: Oklahoma Agricultural Experiment Station.

Certified seed: Available.

Uvalde

Strain collected in 1934 in Uvalde County, Texas -- Gordon Mott, SCS.
Increased at southwestern SCS Nurseries.

Source: Original seed collected from a native stand along railroad right-of-way about one and one-half miles west of Knippa, Texas. This seed was first planted at Stillwater, Oklahoma, and later put in production at the Tucson, Arizona, SCS Nursery. A quantity of the seed was sent from Tucson to San Antonio in 1952, and commercial production started. Named "Uvalde" for the county of origin. Increased for testing as T-20,285 (Tex.) and A2969 (Ariz.)

Description: Uvalde sideoats grama is dark green, erect, very leafy, a heavy seed producer, and superior to common forms of the species in resistance to shattering at seed maturity. This represents the first southern Texas variety to be produced commercially. Area of best adaptation is probably within 100 to 150 miles of Uvalde, though plantings are thriving as far away as Midland and Spur. It proved less desirable than local sources in Arizona and New Mexico because of winter stand loss at higher elevations there.

Released: 1950, cooperatively by Arizona Agricultural Experiment Station and Nursery Division, SCS.

Breeder seed: University of Arizona Plant Materials Center.

Certified seed: None (in commercial production).

Vaughn

Produced at SCS Nursery, Albuquerque, New Mexico.

Source: Collected from native stands near Vaughn, New Mexico 1935, and tested as A 3603.

Method of breeding: Bulk increase of native collection.

Description: Population slightly variable but all have an erect leaf type. Good seedling vigor, easily established. More drouth tolerant than El Reno, Uvalde or Tucson for use in eastern Colorado and New Mexico.

Released: 1940, cooperatively by the New Mexico Agricultural Experiment Station, and the Nursery Division, SCS.

Breeder seed: SCS-N.M. Cooperative Nursery (1958), and Plant Materials Center, Tucson, Arizona.

Certified seed: Limited.

Woodward strains

Selected at the U. S. Southern Great Plains Field Station in cooperation with the Oklahoma Agricultural Experiment Station. They represent sources and experimental strains that have been distributed for testing purposes.

Hope: An apomictic strain collected 15 miles northwest of Hope, New Mexico by J. R. Harlan in 1946. Medium height, fine-stemmed, leafy and very uniform. In several tests it has been the highest yielding variety, but seeds are small and subject to shattering. Seedling vigor is less than Coronado.

W1: Fifty selected plants from a line advanced three generations by selection and isolation. Original source a composite of many sources. Vigorous, leafy forage type and a good seed producer. Light colored inflorescences predominating. Fairly uniform to type.

W2: Fifty plants selected from three lines (74-6545, 74-6546, 74-6547) each of which had been advanced three generations by selection and isolation and here combined. Leafy robust types somewhat less uniform to type and more pigmented than W1.

W3: Fifty plants selected from four lines (74-6552, 74-6553, 74-6554) each of which had been advanced two generations by selection and isolation and here combined. Original sources composited. Plants exceptionally tall and leaves coming well up the stem.

W4: Fifty plants selected from the same lines as W3. Vigorous but shorter, medium leafy and less erect than W3. W4 has looked good in some tests and is being increased for additional testing.

Temple: Fifty plants selected after 4 cycles of mass selection from material originating near Temple, Texas. Leafy and robust, a sexual type.

Bouteloua eriopoda (Torr.) Torr., black grama.

Flagstaff

Increased at the SCS Nursery, Albuquerque, New Mexico.

Source: Field collection along Flagstaff -- Cameron Highway, 20 miles north of Flagstaff, Arizona.

Released: No, being tested as A-3730.

Breeder seed: Maintained at the Arizona Plant Materials Center, Tucson, Arizona.

Certified seed: None.

b-

Bouteloua gracilis (H.B.K.) Lag. ex Steud., blue grama.

Woodward strains

Selected at the U. S. Southern Great Plains Field Station, Woodward, Oklahoma in cooperation with the Oklahoma Agricultural Experiment Station.

Blue grama types have been extensively distributed in small packet lots over the last 10 years. No large scale increases have been obtained because of the difficulty of producing seed. Capitan, Syn. 20 and Syn. 40 are being produced on a small scale at El Reno and Marfa seed is produced in limited quantities at Woodward. Most of the other varieties are now out of the picture.

Capitan: Collection No. 174 from the property of one Don Gregorio Herrera, three miles north of Capitan, New Mexico, to which was added selected plants from collection Nos. 173, 175, and 176 all within 15 miles of collection 174. Extremely leafy, vigorous, pure green in color, it is late flowering at Woodward and vegetatively the most promising variant so far found.

The original type is apparently closely confined to one small watershed north of Capitan, New Mexico. Has looked outstanding at the Central Plains Experimental Range in Colorado, and under irrigation at El Reno, Oklahoma.

Van Horn: Collection No. 46 plus selected plants from collection No. 48 both within 10 miles of Van Horn, Texas. Vigorous, leafy, blue green southern type. Promises to be a good seed producer under good conditions.

Marfa: Collection No. 34 from southern slopes of Davis Mountains, 2 miles north of Marfa, Texas, plus selected tall, early plants from Davis Mountain collections 28 - 41. Tall, leafy, vigorous early flowering type representing the southern slopes of the Davis Mountains. Has looked good under grazing at Woodward, Oklahoma.

Davis: Selected plants from Davis Mountain collections 28 - 41 (except No. 34). Low growing, very leafy late flowering blue type typical of most of the Davis Mountains. A vigorous southern type of considerable promise.

Hueco: Collection No. 55, 15 miles east of Hueco station, Texas, on lower slopes of Hueco hills plus collection No. 57, 14 miles east of Salt Flats, Texas, on lower slopes of Guadalupe Mountains. Vigorous, medium leafy, bluish type of some promise. Hueco was the high yielder in small plot trials at Woodward, Oklahoma.

Pecos: Collection No. 107, 26 miles northeast of Carlsbad, New Mexico, plus selected plants from collection Nos. 106 and 108 within 10 miles of No. 107. Vigorous, southern type apparently adapted to dry sandy conditions of mid-Pecos River valley. Tall, robust, bluish.

Caprock: Collections 92 and 113 within 10 miles of Caprock, New Mexico, plus No. 135 near Kenna, New Mexico. A vigorous strain from edge of the Mescalero ridge, somewhat finer than more southern sources.

Dunlap: Collections No. 120 and 121 near Dunlap, New Mexico, representing high rocky plains west of the upper Pecos River. An outstanding forage type.

Ruidoso: Collections No. 143 and 145 selected individuals from No. 144 all in Rio Ruidoso watershed between Hondo, New Mexico, and Ruidoso, New Mexico. A Montane type but quite different from Capitan which comes from the same mountains. Ruidoso is rather coarse, bluish, shorter leaved and taller stemmed than Capitan.

Roy: Collection No. 201 from Red River canyon west of Roy, New Mexico, plus collection No. 192 near Santa Rosa, New Mexico. This material represents the most promising found in northeastern New Mexico, which region generally provides mediocre material for Woodward conditions. Rather coarse, bluish.

W1: Fifty selected early plants from the 1946 collection of blue grama. A wide variety of vigorous early types intercrossing to provide variable material for regional selection.

W2: Fifty selected late flowering plants from the 1946 blue grama collection. A wide variety of vigorous late types intercrossing to provide variable material for regional selection.

W3: Combining 25 plants of the Betzen strain and 25 plants of the Noble strain after advancing each 3 generations by selection and isolation. The Betzen material originated on the Betzen farm 8 miles south of Woodward, Oklahoma. The Noble strain came from Noble County, Oklahoma. The strains are similar being vigorous, leafy and very late in flowering.

W4: Fifty selected F₄ derivatives from the crosses Mexican Springs (New Mexico) x Ft. Supply (Oklahoma) and reciprocal. Fairly uniform material intermediate between the two original types. Finer, earlier and greener than local Ft. Supply material. Leafier, less spreading, and with better seeding habits than Mexican Springs.

Syn. 20: One-hundred selected plants from sources known to have 2n = 20 chromosomes. These sources were mostly from central New Mexico and west Texas (See: Snyder, L. A. and J. R. Harlan. "A cytological study of *Bouteloua gracilis* from western Texas and eastern New Mexico". Am. Jour. Bot. 40(9): 702-707. 1953)

Syn. 40: One-hundred selected plants from sources known to have 2n = 40 chromosomes. These sources were from central New Mexico at fairly high elevations. (See reference above)

Bromus carinatus Hook. & Arn., California bromegrass.

Cucamonga

Selected at the Plant Materials Center, SCS, U.S.D.A., Pleasanton and San Fernando, California -- Paul B. Dickey, Paul E. Lemmon, and D. J. Vanderwal.

Source: Collected from a native stand near Cucamonga, California, September 15, 1939 by the Cucamonga CCC Camp Agronomist, name unknown.

Method of breeding: Mass phenotypic selection made from small plot seeded at Pleasanton in 1941. Selection given accession number P 11,117 and tested at San Fernando Nursery in comparison with other annual grasses.

Description: A rapid developing, early-maturing, self-perpetuating annual grass specifically developed to stabilize sand and control wind and water erosion in vineyards of southern California. It has a large seed and strong seedling vigor.

Because of its early maturity, Cucamonga bromegrass does not rob moisture from dryland grapes. Sub-surface tillage at this time insures a good stand the next year.

Released: 1949, cooperatively by the University of California Agricultural Experiment Station and the San Fernando Nursery, SCS, U.S.D.A.

Breeder seed: Plant Materials Center, SCS, U.S.D.A., Pleasanton, California.

Certified seed: Not available. (No commercial seed available at present).

Bromus catharticus Vahl, rescuegrass.

Chapel Hill

Source: From commercial seed, Wyatt Seed Company, Raleigh, North Carolina, originally from Nicholson Seed Company, Texas -- F. J. le Clair, Paul Tabor, and L. R. Roof.

Method of breeding: Natural selection for longevity and resistance to smut and mildew.

Description: A vigorous strain with a strong tendency to be perennial at the northern border of the cotton belt and with considerable resistance to smut and mildew in the states east of Alabama and Tennessee.

Released: Not formally. Distributed from SCS Nursery, Chapel Hill, North Carolina fall of 1947.

Breeder seed: None.

Certified seed: None.

Seed in commercial trade channels often mixed. For pure seed request names of growers from SCS.

Lamont

Selected at the Delta Branch Experiment Station, Stoneville, Mississippi; Agricultural Research Service, U.S.D.A. cooperating - H. W. Johnson.

Source: La Estanzuela 157/49. Seed of this strain was obtained in Uruguay and introduced as P.I. 193,144.

Method of breeding: Mass selection. Seed was harvested in May 1953 from 2-year-old plants in a plot seeded at Stoneville, Mississippi, in 1951.

Description: The variety appears to consist largely of plants that are biennials or short-lived perennials. Consequently, it provides a longer grazing season during the second and subsequent years of the stand than during the year of establishment, or when grown as a winter annual. Lamont is highly resistant to head smut. In tests at Stoneville, Mississippi, Lamont proved immune to head smut collections from Auburn, Alabama; College Station, Texas; Raymond and Stoneville, Mississippi; and Watkinsville, Georgia. It proved moderately susceptible to a collection from Baton Rouge, Louisiana, which appears to represent a different race of the head smut fungus.

Released: 1957, cooperatively by the Mississippi Agricultural Experiment Station and the Crops Research Division, A.R.S.

Breeder seed: Delta Branch Experiment Station, Stoneville, Mississippi.

Certified seed: Should be available in 1958.

Prairie

Selected at the Imperial Valley Experiment Station, El Centro, California -- L. G. Goar.

Source: Introduced from New Zealand by Wayne Fisher.

Method of breeding: Mass selection at El Centro. Increased at Plant Materials Center, SCS, U.S.D.A., Pleasanton, California for field scale testing.

Description: Prairie bromegrass is a rapid developing, high producing, short-lived perennial bunchgrass. It has a high fertility level requirement and is very palatable to livestock. Tests showed it produced as much first year feed in irrigated pasture mixtures as annual and perennial ryegrass and to be less competitive to the longer-lived, slower developing perennial grasses in the mixture. Under normal grazing practice, Prairie bromegrass disappears from the mixture by the end of the second year.

Released: Certified by the California Crop Improvement Association in 1946.

Foundation seed: California Crop Improvement Association and the Plant Materials Center, SCS, U.S.D.A., Pleasanton, California.

Certified seed: Available in quantity.

Rescue 440

Selected at the Tennessee Agricultural Experiment Station, Knoxville, Tennessee -- J. K. Underwood.

Source: Local naturalized colony.

Method of breeding: Selection of longer-lived plants, high in seed and forage production.

Description: Isolated in 1940 as a short-lived perennial of excellent production and quality. Performed very satisfactorily at several locations in the southeast.

Released: No, distributed for testing. Has been abandoned.

Breeder seed: Not available.

Texas 46

Selected at the Texas Agricultural Experiment Station, College Station, Texas - G. C. Warner, R. L. Hensel, and R. C. Potts.

Source: A plant introduction from Australia, P. I. number unknown.

Method of breeding: Individual plants were selected from an Australian introduction and increased for testing.

Description: Good seedling vigor, mildew resistance, early growth, good yield of forage and seed.

Released: 1946, by the Texas Agricultural Experiment Station.

Breeder seed: Not available.

Certified seed: Available.

Bromus coloratus Steud.,

A-12445

Increased at the SCS, Nursery at Tucson, Arizona -- C. G. Marshall and L. P. Hamilton.

Source: Introduced from Australia as P.I. 150,144.

Description: Similar to certified Prairie bromegrass, but about 2 weeks earlier in maturity. Heavy seeder.

Released: Cooperatively by Arizona Agricultural Experiment Station and Nursery Division, SCS.

Breeder seed: Arizona Plant Materials Center, Tucson, Arizona.

Certified seed: None.

Bromus inermis Leyss., smooth bromegrass.

Achenbach

Source: Old fields tracing to the original planting in 1895 by the Achenbach Brothers of Washington County, Kansas.

Method of breeding: Some mass selection in early generations by the Achenbach Brothers, the early growers.

Description: A typical "southern" type of smooth bromegrass. It is leafy and vigorous, spreads rapidly by rhizomes to form a dense, competitive sod, is a heavy producer of both seed and forage, and is far less susceptible to leaf diseases than "northern" types with which it has been compared in Kansas. Most of the smooth bromegrass grown in Kansas is of this strain.

Released: Named Achenbach in 1944 by the Kansas Agricultural Experiment Station and old fields that could be traced to the Achenbach Brothers' plantings were then declared eligible for certification. They have been the source of all fields now grown for certification.

Breeder seed: None.

Certified seed: Available in quantity.

B. in.-12

Selected at the Utah Agricultural Experiment Station, Logan, Utah; ARS, U.S.D.A. cooperating -- W. Keller.

Source: Northern types.

Method of breeding: Mass selection.

Description: Includes 28 high-yielding, chiefly non-spreading or restricted-spreading clones. Has performed well at higher elevations in some of the Intermountain States and in the Northern Great Plains.

Released: No, included in regional grass tests.

Breeder seed: Has been discontinued.

Elsberry

Selected at the former SCS Nursery, Elsberry, Missouri.

Source: Believed to be derived from an old field located in either northwestern Missouri or southeastern Iowa.

Description: A southern early-maturing strain of smooth bromegrass. Best of several accessions tested at the Elsberry, SCS Nursery.

Released: Cooperatively by the Missouri Agricultural Experiment Station and the Nursery Division, SCS.

Breeder seed: Missouri Agricultural Experiment Station.

Certified seed: Not available. (Some commercial production)

Experimental Synthetic L

Selected at Cornell University, Ithaca, New York -- R. P. Murphy.

Source: Wide collection of seed lots from plant breeders in the United States. Parental clones: N.Y. 46-19, N.Y. 46-92, N.Y. 46-157, N.Y. 46-166, N.Y. 47-7, N.Y. 47-217, N.Y. 48E-1, N.Y. 48E-7, N.Y. 48E-11, N.Y. 48E-15, N.Y. 48E-22, N.Y. 48F-2, N.Y. 48-176, Pasture Laboratory N.Y. 47PL-23(I-23), N.Y. 47PL-45(III-6), N.Y. 47PL-85(III-46), N.Y. 47PL-92(IV-2), N.Y. 47PL-115(IV-25).

Method of breeding: Synthetic variety developed from 18 selected, relatively self-incompatible clones. Five of the clones originated at the U. S. Regional Pasture Research Laboratory. First and second generation seed produced as for Saratoga.

Description: Similar to Saratoga but not quite as high in aftermath production.

Released: No - to be continued under test.

Fischer

Source: Original seed collected in 1939 by M. E. Heath, Soil Conservation Nursery, Ames, Iowa, from old field of bromegrass established in 1917 on E. A. Fischer farm near Shenandoah, Iowa.

Method of breeding: Original lot of seed planted at SCS Nursery at Ames, Iowa, in 1940 for increase and subsequent testing by Iowa Agricultural Experiment Station and SCS. Several generations of seed increase by SCS and the Iowa Agricultural Experiment Station have followed.

Description: Performance tests to date show Fischer to be aggressive, productive, hardy, and well adapted to the better soils. In most respects, it is similar to the other "southern" bromegrasses, Lincoln and Achenbach.

Released: 1943, cooperatively by the Iowa Agricultural Experiment Station and the Nursery Division, SCS.

Foundation seed: Iowa Agricultural Experiment Station, Ames, Iowa.

Certified seed: Limited.

Jeanerette

Source: Old fields, southern Lyon County, Kansas; first grown in the mid-1890's on the Henry Jeanerette farm and later widely grown in that part of Kansas.

Description: Typical "southern" type of smooth bromegrass resembling Achenbach in growth habit and forage yield.

Released: Not officially named but widely grown in the area south of Emporia, Kansas, under the local name, Jeanerette, after the original grower in that area.

Breeder seed: None.

Certified seed: Not certified.

Lancaster

Selected at the Nebraska Agricultural Experiment Station, Lincoln, Nebraska, Agricultural Research Service, U.S.D.A., cooperating -- L. C. Newell.

Source: Clones collected from old fields in Nebraska.

Method of breeding: Produced in 1943 by the field hybridization of clones from five unrelated sources. Selection of clones was based on previous evaluation of their sibbed and open-pollinated progenies, the studies beginning with selections from farmers' old fields in 1937.

Description: Lancaster is the leading smooth bromegrass variety in forage and seed yields in tests at Lincoln, Nebraska, 1947-1952. Lancaster showed immediate promise among several experimental synthetic varieties in early comparative tests at the Nebraska Station. On fertile soils, it is a leafy vigorous strain with fine stems and somewhat drooping panicles. Seed of advanced generation was first distributed as Nebraska 44 for broad testing. It has been widely compared in North Central States where it is among the promising varieties.

Released: 1950, cooperatively by the Nebraska Agricultural Experiment Station and the Crops Research Division, Agricultural Research Service.

Foundation seed: Foundation Seed Division, Department of Agronomy, Nebraska Agricultural Experiment Station.

Certified seed: Available in quantity.

Lincoln

Developed at Nebraska Agricultural Experiment Station, Lincoln, Nebraska, ARS, U.S.D.A., cooperating - L. C. Newell and A. L. Frolik.

Source: Old fields of bromegrass derived from early introductions of bromegrass prior to 1898, attributed to Hungarian origin (California introduction of 1884).

Method of selection: Plot tests of farmer strains of bromegrass were conducted (1939-1942) which showed the comparative superiority of locally grown southern strains as compared with strains of northern origin.

Fields which showed superiority and which were traced to a common origin were first approved (1941) for seed increase and later certified as Lincoln bromegrass (1942).

Description: A cool-season grass which provides abundance of early spring pastureage and fall regrowth under favorable conditions. A rhizomatous sod-forming type of bromegrass, well adapted for conservation purposes in central latitudes as compared with less aggressive northern types. Exhibits good seedling vigor and relative ease of establishment on critical planting sites.

Released: 1942, cooperatively by the Nebraska Agricultural Experiment Station and the Crops Research Division, ARS.

Foundation seed: Foundation Seed Division, Department of Agronomy, Nebraska Agricultural Experiment Station, Lincoln, Nebraska.

Certified seed: Available in quantity.

Lyon

Selected at the Nebraska Agricultural Experiment Station, Lincoln, Nebraska, ARS, U.S.D.A., cooperating - L. C. Newell

Source: Developed from selections made in farmers' strains of certified Lincoln smooth bromegrass. Later progenies became outcrossed in a selection nursery to a broad source of germ plasm of southern type bromegrass.

Method of breeding: Single clones of Lincoln smooth bromegrass were selected for seed quality and forage type and were isolated; crossed seed was composited and tested as B9. Seed from the progenies of these selections, later outcrossed to a large number of open-pollinated lines of southern type, was bulked and retested as Nebraska 36.

Description: The variety maintains the broad adaptation of the Lincoln smooth bromegrass parental stock combined with superior seed quality, seed -ling vigor, and a more uniformly desirable plant type. It has produced larger yields of forage and seed in Nebraska tests than Lincoln smooth bromegrass. As Nebraska 36, and later as Lyon, the variety has been tested widely since 1947, showing promise over a broad range of conditions. The variety was named after Professor T. L. Lyon who first worked with smooth bromegrass at the Nebraska Station in 1897.

Released: 1950, cooperatively by the Nebraska Agricultural Experiment Station and the Crops Research Division, ARS.

Foundation seed: Foundation Seed Division, Department of Agronomy, Nebraska Agricultural Experiment Station, Lincoln, Nebraska.

Certified seed: Available in quantity.

Manchar

Selected at the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington -- J. L. Schwendiman, A. C. Law, A. L. Haferrichter, and D. C. Tingey.

Source: Original introduction in 1935 from the Kungchuling Experiment Station of the South Manchurian Railway, Manchuria, PI 109,812.

Method of breeding: Grown in nurseries at Plant Materials Centers since 1935; subjected to mass selection and tested in uniform nurseries and strain trials since 1937, as P-177.

Description: Intermediate between the weakly spreading northern types and the aggressive sod-forming southern types; maintains good balance with associated legumes; produces a vigorous seedling; good yields of seed and forage; and recovers rapidly after cutting. Its dark, purple-cast seeds thresh easily, and the seed is generally heavier than that of common smooth bromegrass.

Released: 1943 as P-177 cooperatively by the Idaho and Washington Agricultural Experiment Stations, and the Pullman, Washington and Aberdeen, Idaho Plant Materials Centers, SCS, U.S.D.A. Named Manchar in 1946.

Breeder seed: Plant Materials Center, SCS, U.S.D.A., Pullman, Washington

Certified seed: Available in quantity.

Mandan 404

Selected at U. S. Northern Great Plains Field Station, Mandan, North Dakota -- George A. Rogler.

Source: From a local field collection of northern material.

Method of breeding: Developed by selection within a single plant progeny after two generations of single plant selection under open pollination. Both inbred and open pollination progeny tests were made of each of the 8 clones going into the variety.

Description: Plants are short, fine, very high in quality, and light green in color. The strain is not aggressive and is not a high yielder, but is higher in protein at Mandan at all stages of growth than is Lincoln. Tests at Mandan show 404 to be higher in palatability than Lincoln.

Released: No, entered in regional testing programs in 1948.

Breeder seed: Small amounts at U. S. Northern Great Plains Field Station, Mandan, North Dakota.

Martin

Selected at the Minnesota Agricultural Experiment Station, St. Paul, Minn.

Source: Seed obtained from old fields of smooth bromegrass in Martin Co., Minnesota.

Method of breeding: 88 plants were selected from a space-planted nursery which had been studied over a 2-year period. Selections were cloned and on the basis of yield, leafiness, and freedom from leaf spot, 21 clones were allowed to reproduce by natural cross pollination.

Description: Somewhat intermediate in growth between southern and northern strains. Generally classed as a northern strain. It has produced higher forage yields than Canadian common in Minnesota.

Released: Yes, by the Minnesota Agricultural Experiment Station.

Breeder seed: Not available (limited amount of old seed may be in storage).

Certified seed: Not available (was recommended and certified in Minnesota for several years, but has been discontinued).

Michigan B-2

An accession number assigned by the U.S.D.A. to a commercial lot of Canadian smooth bromegrass increased at the Michigan Agricultural Experiment Station. Original seed planted at East Lansing, Michigan, in 1937. For a few years seed from this source was certified by the Michigan Crop Improvement Association but was discontinued because of the problem of quackgrass impurities.

Minnesota synthetics

Selected at the Minnesota Agricultural Experiment Station, St. Paul, Minnesota - A. R. Schmid, H. K. Hayes, and H. L. Thomas.

Source: Commercial strains and a collection from Martin Co., Minnesota.

Method of breeding: Individual plants and clones studies during period from 1936 to 1945. In 1945, the 50 best appearing selections were included in a polycross nursery. These clones and their polycross progeny were studied for yield, vigor, resistance to leaf spot, and maturity.

Description: Six experimental synthetics were developed:

A - Four most vigorous clones.

B - Eight clones low in leaf spot, and most vigorous in the low leaf spot group.

C - Eight clones selected for lateness, and the most vigorous in the late group.

D - Increase of clone 38.

E - Increase of clone 17.

G - Eight clones selected for extreme lateness at the expense of other characteristics.

Released: No, some synthetics included in regional tests.

Breeder seed: University of Minnesota. Further increase is not planned at this time. Second cycle material will be evaluated.

Oklahoma brome (Chapel Hill Brome (Ky.))

Source: Strains BN (Beltsville Nursery) 4415, 4416, 4417 (from Oklahoma) and SC 20-905 (a collection made by Paul Tabor near Roanoke, Virginia). Paul Tabor - L. R. Roof, SCS Nursery, Chapel Hill, North Carolina.

Method of breeding: Selection of most vigorous disease resistant plants from Oklahoma strains and transplanting these with the Roanoke, Virginia strain in an isolated block.

Description: A vigorous more southern strain than other smooth bromegrass varieties.

Released: No - Seed distribution from SCS Nursery, Chapel Hill, North Carolina in 1949.

Breeder seed: None

Certified seed: None

Seed available in Western Kentucky under the name Chapel Hill brome. Write Joe D. Little, Area Conservationist, SCS, Bowling Green, Kentucky for sources.

Oklahoma 1

Selected at the Oklahoma Agricultural Experiment Station, Stillwater, Oklahoma (see Southland).

Source: This selection was made in 1942 from an old field of smooth brome-grass (Kansas origin) established in 1936.

Method of breeding: The selection was grown in bromegrass nurseries from 1942 to 1948, inclusive.

Description: A tall, vigorous, late, leafy, medium heavy seed producer. Moderately free of disease.

Released: No, included in regional testing program. Discontinued in favor of Southland.

Breeder seed: Not available.

Parkland

Selected at the Dominion Forage Crops Laboratory, Saskatoon, Saskatchewan.

Source: Increased progeny of a third generation inbred line descending from a single plant selected in 1923 along a roadway near Saskatoon.

Description: Rhizomes present, but spread restricted to about 60 percent of that of common smooth bromegrass. Considerably more sterile culms and lower seed yields (40 to 50 percent) than common.

Released: Canada Department of Agriculture

Breeder seed: No longer available in original form. Forage Crops Laboratory, Saskatoon, Saskatchewan.

Certified seed: Not available.

Sandburg

Selected 1925-1933 by Douglass Lytle, Montrose, Colorado from ordinary or common smooth bromegrass.

Source: Clarence Sandburg, Montrose, Colorado, Successor to Douglas Lytle.

Method of breeding: Selection of more robust plants, blending and increasing in bulk.

Description: Similar to Lincoln, but very slightly earlier.

Released: Seen sold by Lytle & Sandburg and tested by Colorado Experiment Station.

Breeder seed: None

Certified seed: Very little, if any, seed now available.

Saratoga

Selected at Cornell University, Ithaca, New York -- R. P. Murphy and S.S. Atwood.

Source: Wide collection of seed lots from plant breeders in the United States.
Parental clones: N.Y. 46-11, N.Y. 46-19, N.Y. 46-92, N.Y. 46-157, N.Y. 46-166.

Method of breeding: Synthetic variety developed from 5 selected, relatively self-incompatible clones. Breeder seed is produced in an isolated plot from randomly planted vegetative pieces of the five clones in 100 or more replications. Equal amounts of seed from each parental clone are mixed together for breeder seed. Foundation seed is the first advanced generation from breeder seed. Certified seed is the first advanced generation from foundation seed and is not eligible for use as planting stock for the production of any class of certified seed.

Description: A vigorous variety characterized by high seedling vigor, early spring growth, and quick recovery and high aftermath production following cutting. It has yielded 8% more in total season yield and 29% more in aftermath yield than Lincoln when grown alone. It has yielded the same as Lincoln when grown in mixture with alfalfa but a higher proportion of the mixture has been grass. It has been similar to Lincoln in yield and quality of seed. It has been similar to Lincoln in resistance to brown spot and scald and superior to Canadian Common and Manchar.

Released: 1955, by the Department of Plant Breeding, Cornell University.

Breeder seed: Department of Plant Breeding, Cornell University.

Certified seed: Foundation seed from 1958 crop from The New York Foundation Seed Stocks Cooperative, Inc., Plant Science Building, Cornell University, Ithaca, New York. No certified seed available in 1957.

Southland

Selected at the Oklahoma Agricultural Experiment Station, Stillwater, Oklahoma--W. B. Gernert, H. W. Staten, M. D. Jones, W. C. Elder, and R. A. Chessmore.

Source: A small field of smooth bromegrass (seed of Kansas origin) seeded on Agronomy Farm in 1936. Selections were made from this field, and other selections obtained from additional introductions. Original source of seed of the selections is rather obscure.

Method of breeding: Five open pollinated lines were selected as showing superior characteristics and performance and were bulked for testing as Oklahoma Synthetic.

Description: The differences that generally separate the southern from the northern types of smooth bromegrass are accentuated in Southland. It is rather coarse, broad leaved, and heavy stemmed. Individual plants average somewhat taller and are somewhat later in maturity than the average of other southern types. The variety has somewhat greater resistance to leaf diseases than most of the standard southern strains, but its chief advantage is in a significantly greater yielding capacity, greater seedling vigor, and generally better adaptation to southern conditions.

Released: 1953, by Oklahoma Agricultural Experiment Station.

Breeder seed: Oklahoma Agricultural Experiment Station.

Certified seed: Available in quantity.

Wisconsin B-55

Selected at Wisconsin Agricultural Experiment Station, Madison, Wisconsin - D. C. Smith and E. L. Nielsen.

Method of breeding: Synthetic made up of 88 plants, following one or more generations of inbreeding and selection. Parental clones vigorous, strongly creeping, dark green in color, moderately tall and of medium leafiness.

Description: Approaches southern-adapted strains in general morphological characteristics, equals southern strains in yield (in Wisconsin) and appears to possess greater disease resistance than other named strains.

Released: No, Syn-2 seed made available for testing in 1955.

Breeder seed: Wisconsin Agricultural Experiment Station, Madison, Wisconsin.

Wisconsin B-63

Selected at Wisconsin Agricultural Experiment Station, Madison, Wisconsin - D. C. Smith and E. L. Nielsen.

Method of breeding: Synthetic based on 44 plants selected following one or more generations of inbreeding and selection. Selected plants were tall, of medium earliness and texture. Leafiness and creeping habit intermediate, foliage medium to early in maturity.

Description: Yielding capacity about same as other varieties (in Wisconsin) but disease reaction somewhat better than commercially available strains.

Released: No, Syn. 2 seed made available for testing in 1955.

Breeder seed: Wisconsin Agricultural Experiment Station, Madison, Wisconsin.

Bromus marginatus Nees, mountain bromegrass.

Bromar

Selected at the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington -- A. L. Hafnerichter, A. G. Law, and J. L. Schwendiman.

Source: Native collection made at Pullman, Washington 1933 - assigned accession number WN-439. A selection, P-3360 from this accession was used in developing Bromar.

Method of breeding: Mass selection with screening for head smut resistance. Bromar was one of four ecotypes among 69 accessions of mountain bromegrass tested.

Description: Bromar is a rapid-developing, late-maturing, perennial bunchgrass. It is tall, erect, vigorous with medium-coarse stems and abundant, broad, well distributed leaves. When compared with the commercial strain, Bromar is taller, leafier, highly resistant to head smut, and two weeks later in maturity; has more seedling vigor and is earlier in spring recovery. It is a heavy seed and forage producer, is compatible in rate of growth with sweetclover, and has a seed which is readily de-awned. It has been outstanding in performance in mixtures with sweetclover or red clover for pasture or green manure in short rotations.

Released: 1946, cooperatively by the Washington, Idaho, and Oregon Agricultural Experiment Stations; the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington; and the Crops Research Division, Agricultural Research Service. Seed distributed in 1940.

Breeder seed: Plant Materials Center, SCS, U.S.D.A., Pullman, Washington.

Certified seed: Available in quantity.

Bromus mollis L., soft bromegrass.

Blando

Selected at the Plant Materials Center, SCS, U.S.D.A., Pleasanton, California -- H. W. Miller and O. K. Hoglund.

Source: Collected May 21, 1940 from winter-annual rangeland near San Ramon, California by D. J. Vanderwal.

Method of breeding: Tested in comparison with 27 other collections of Bromus mollis by the Pleasanton Plant Materials Center and the former San Fernando Nursery, SCS, U.S.D.A., since the fall of 1940 as P-11657.

Description: A winter-growing, heavy root producing, self-seeding annual grass for range and brush burn seeding, and for the conversion of abandoned grainland to range. Its primary advantage over other strains is its consistent forage and seed production from year to year. During unfavorable years, Blando bromegrass has demonstrated its superiority by outperforming all other strains. Although well adapted to low fertility sites, this grass responds exceptionally well to applications of fertilizer.

In relation to other strains tested, it is intermediate in time of maturity and sub-erect in growth habit.

Released: Cooperatively by the University of California Agricultural Experiment Station and the Pleasanton, California Plant Materials Center, SCS, U.S.D.A.

Breeder seed: Plant Materials Center, SCS, U.S.D.A., Pleasanton, California.

Certified seed: Available.

Bromus tomentellus Boiss., red bromegrass.

P-2447

Selected at the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington -- J. L. Schwendiman.

Source: PI 111,530, from the Institute of Plant Industry, Leningrad, Russia - Westover-Enlow Expedition.

Method of breeding: Developed by mass selection through several generations.

Description: Red bromegrass is a rapid developing, early maturing, short-lived perennial bunch-type brom. The leaves are dark green, lightly pubescent, abundant, mostly basal and very low in lignin content. Seed culms are few and seed production is relatively low after the first season. Seeds are short awned. It has outstanding spring recovery and rapid recovery after cutting. Seedling vigor is strong and a strong root system is developed. Leaves remain green long after seed matures.

Red bromegrass appears to be best adapted to conservation seedings on medium-textured soils at elevations above 2,000 feet where effective moisture is over 18 inches annually.

Released: No, included in testing programs.

Breeder seed: Plant Materials Center, SCS, U.S.D.A., Pullman, Washington.

Certified seed: Not available.

Buchloe saccylloides (Nutt.) Engelm., buffalograss.

Mesa

Selected at the U. S. Southern Great Plains Field Station, Woodward, Oklahoma in cooperation with the Oklahoma Agricultural Experiment Station - J. R. Harlan.

Source: The female plant (1-2022) was obtained from Wildorado, Texas by M. L. Peterson in 1940. The male plant (2x-22 32-3) was selected in 1944 from the progeny of the cross 35-17-c (from Hays, Kansas) x O-1 (from Chillicothe, Texas).

Method of breeding: Selection for superior combining ability.

Description: Mesa is the F₁ progeny of cross between clones 1-2022 and 2x-2232-3. Seed fields must be established from sod. The F₁ is variable but as a population is vigorous, spreads rapidly and has an apparently high yield of forage. The female and male parents will be planted in seed production fields at a ratio of 4 to 1. The female parent is vigorous and characterized by exceptional height of bur and outstanding shatter resistance.

Released: Consideration will be given to releasing this variety in 1958.

Breeder seed: Oklahoma Agricultural Experiment Station.

Certified seed: None.

Cynodon spp., bermudagrasses.

Bayshore (Gene Tift)

Selected from Bayshore Golf Club, Miami Beach, Florida.

Source: Selected vegetatively from Bayshore Golf Club, Miami Beach, Florida, by Dr. Roy A. Bair in 1945, and placed in an evaluation nursery at the University of Florida Everglades Experiment Station as Bayshore. At about this same time the name Gene Tift was suggested for this grass in tribute to the man of the same name who propagated considerable quantities for distribution to golf courses in the area. This synonymy continued among golf circles. This selection was among the group transferred to the Florida Agricultural Experiment Station, Gainesville, when the present turf research program was initiated in 1952. Under the new program it was established for further evaluation and classification as FB 3.

Method of breeding: Reported to be by natural crossing of native Florida turf-type bermudagrass selections with selections of *Cynodon* species from South Africa supplied by Dr. John Monteith, then Director U. S. Golf Assn. Green Section. Plots of various introductions were planted vegetatively among native selections in a test nursery at the Bayshore Golf Club just prior to World War II by Mr. Fred Hurger, then Superintendent of the golf course. The golf course was closed during the war and the grasses grew unattended. The golf course was re-opened after the War and a number of plant types were visible. This particular selection was one of several collected by Dr. Bair for testing and evaluation. The selection has been maintained vegetatively, producing no appreciable quantity of viable seed. Records on the African introductions are not available, but it is believed to have been *Cynodon transvaalensis*.

Description: A light green, fine textured putting green type bermudagrass which seems more adapted to south than to north Florida. More upright in growth, this selection produces more clippings yet is inferior in turf quality to Everglades 1 in tests at Gainesville. Still a marked improvement in putting green quality over common seeded commercial bermudagrass. Bayshore shows distinct resistance to certain leafspot diseases (*Helminthosporium* spp.) compared to common bermudagrass.

Released: Not officially as yet although has been distributed in the golf turf industry.

Breeder or foundation material: None as yet available.

Coastal

Selected at Georgia Coastal Plain Experiment Station, Tifton, Georgia; Agricultural Research Service, U.S.D.A., cooperating -- Glenn W. Burton.

Source: An F₁ hybrid between Tift bermudagrass (discovered by J. L. Stephens in an old cotton patch near Tifton, Georgia, in 1929) and a tall-growing introduction from South Africa.

Method of breeding: Parents were interplanted to allow for maximum natural crossing. Over 5,000 seedling plants were carefully screened for many traits. A few of the best clones were subjected to numerous replicated tests giving measures of their palatability, efficiency, yield potential, management requirements, production under grazing, etc. Tested as No. 35.

Description: When compared with common bermudagrass, Coastal has larger and longer stems, stolons, and rhizomes; grows much taller; has a lighter green color; has a deeper and more efficient root system; is more resistant to foliage diseases, root-knot nematode, frost, and drought; is much more efficient in nutrient and water use; is more palatable and produces nearly twice as much forage and animal products. This superiority holds throughout most of the bermudagrass belt, demonstrating wide adaptation. It produces few seedheads that rarely contain viable seed and must be propagated vegetatively.

Released: 1943, cooperatively by the Georgia Coastal Plain Experiment Station and the Crops Research Division, Agricultural Research Service.

Breeder stock: Georgia Coastal Plain Experiment Station, Tifton, Georgia.

Certified stock: Available in quantity.

Everglades No. 1

Selected from Bayshore Golf Club, Miami Beach, Florida.

Source: Selected vegetatively from Bayshore Golf Club, Miami Beach, Florida, by Dr. Roy A. Bair in 1945, and placed in an evaluation nursery at the University of Florida Everglades Experiment Station as Everglades 1. The turf work at this station was discontinued in 1950 and the plant material was transferred to the Florida Agricultural Experiment Station, Gainesville, in 1952. This selection was entered in the testing program as FB 4.

Method of breeding: Reported to be by natural crossing of native Florida turf-type bermudagrass selections with selections of Cynodon species from South Africa supplied by Dr. John Monteith, then Director, U. S. Golf Assn. Green Section. Plots of various introductions were planted vegetatively among native selections in a test nursery at the Bayshore Golf Club just prior to World War II by Mr. Fred Hurger, then Superintendent of the golf course. The golf course was closed during the war and the grasses grew unattended. The golf course was re-opened after the war and a number of plant types were visible. This particular selection was one of several collected by Dr. Bair for testing and evaluation. The selection has been maintained vegetatively, producing no appreciable quantity of viable seed. Records on the African introductions are not available, but it is believed to have been Cynodon transvaalensis.

Description: A dark green, uniform, fine textured, close growing, vigorous putting green type bermudagrass of good quality which appears adapted throughout Florida. Much superior in turf quality to common seeded commercial bermudagrass and resistant to certain leafspot (Helminthosporium spp.) diseases associated with the common type.

Released: Not officially as yet, although has been distributed in the golf turf trade.

Breeder or foundation material: None as yet available.

Greenfield

Selected at the Oklahoma Agricultural Experiment Station, Stillwater, Oklahoma.

Source: Selected from among a large number of common strains collected from all parts of Oklahoma. This particular selection was found on the Station farm.

Description: Intermediate between coarse and very fine types of common bermudagrass. Exposed stolons purple in color; rhizomes short, crooked, numerous forming dense mat. Winter hardy variety. Requires fertile soil especially high in nitrogen but one of its chief advantages is its ability to grow on the less fertile soils. Variety is propagated vegetatively.

Released: 1954, by Oklahoma Agricultural Experiment Station.

Breeder sod: Oklahoma Agricultural Experiment Station.

Certified sod: Available.

Midland

Selected at the Georgia Coastal Plain Experiment Station, Tifton, Georgia; Agricultural Research Service, U.S.D.A., cooperating -- Glenn W. Burton.

Source: An F₁ hybrid between a cold-resistant, common bermudagrass from Indiana, supplied by Dr. G. O. Mott, and Coastal bermudagrass.

Method of breeding: In 1942, enough seed of the cross, Indiana bermudagrass x Coastal bermudagrass, was made to give 66 F₁ hybrids evaluated for many characteristics beginning in 1943. The most productive, No. 13, is more cold-resistant than Coastal, surviving two winters at Lafayette, Indiana, where Coastal bermudagrass winterkilled.

Description: Midland is taller, larger, leafier, and more disease resistant, producing a more open sod than common bermudagrass. Superior to common bermudagrass in most of the good traits that characterize Coastal, Midland (No. 13) is less productive than Coastal where the latter does not suffer stand loss due to winter injury. It has a darker green color, tends to produce more heads and starts growth earlier in the spring than Coastal. Its superiority over Coastal bermudagrass in tests at Stillwater, Oklahoma, led to its release in that state. It is recommended for the northern part of the bermudagrass belt.

Released: 1953, cooperatively by the Oklahoma Agricultural Experiment Station, the Georgia Coastal Plain Experiment Station, and the Crops Research Division, Agricultural Research Service.

Breeder stock: Georgia Coastal Plain Experiment Station, Tifton, Georgia. Foundation stock maintained at the Oklahoma Agricultural Experiment Station, Stillwater, Oklahoma.

Certified stock: Available in quantity.

NK-37

Selected at Phoenix, Arizona, by Northrup, King and Company - Dale Grissom.

Source: Seed harvested (in about 1938) from a giant strain observed growing on an island in the Colorado River near Yuma, Arizona. This seed collection was increased and tested in Hawaii, where it performed very satisfactorily. Seed was produced for several years, but production was eventually discontinued.

Method of breeding: Superior plants selected from the old, established production field were moved to a clonal nursery at Phoenix, Arizona. Plants selected on basis of superior growth habit, vigor, disease resistance and seed productiveness. Bulk seed from selected plants identified as NK-37 bermudagrass.

Description: Tall, giant strain, double the size of common bermudagrass in Yuma area.

Released: Seed distributed for testing in 1957 and 1958.

Breeder seed: Northrup King and Company.

Certified seed: None (limited amount of seed available commercially in 1958).

Ormond (FB 25)

Selected from the Ellinor Village Country Club, Ormond Beach, Florida

Source: Selected vegetatively by Dr. Roy A. Bair about 1946 from a long established fairway showing superior turf performance at the Ellinor Village Country Club. When entered in a testing nursery at the Everglades Agriculture Experiment Station of the University of Florida at Belle Glade this selection was designated as Ormond. In 1952 when the turf program was transferred to the main station at Gainesville, the selection was entered in a comprehensive testing nursery as (FB 25).

Method of breeding: As far as can be determined it appears to have been a natural selection. Quite possibly it developed from natural crossing of native and Arizona common bermudagrasses during the years of World War II when the golf course was inactive and grown up. As with most golf courses, maintenance records are not complete enough to show practices which might shed further light on the history of this selection.

Description: This selection has an attractive blue-green color, is vigorous, competitive and well adapted throughout Florida. It has medium texture making it suitable for golf tees and fairways as well as recreational areas. It grows uniformly, is somewhat more prostrate in habit than Tiflawn and has less tendency to produce thatch. Much superior to common bermudagrass in turf performance, it is resistant to certain leafspot diseases (Helminthosporium spp.) associated with common bermudagrass, but has a marked susceptibility to dollar spot disease (Sclerotina homoeocarpa).

Released: Not officially as yet, although distributed in the golf turf industry.

Breeder or Foundation Material: None as yet available.

Sunturf

Increased at several Experiment Stations in the Southeastern United States.

Source: P.I. 184,339, *Cynodon magennissii*.

Description: A perennial fine-leaved, dark green bermudagrass, with low habit of growth, with creeping stolons, spreads rapidly, drought resistant, not shade tolerant, produces few seed heads -- so far no seed have been found. It sometimes has rust.

Released: 1956, cooperatively by the Alabama, Arkansas, Oklahoma, and South Carolina Experiment Stations.

Foundation sod: Available from the above mentioned Agricultural Experiment Stations.

Certified sod: Available.

Suwannee

Selected at Georgia Coastal Plain Experiment Station, Tifton, Georgia; Agricultural Research Service, U.S.D.A., cooperating -- Glenn W. Burton.

Source: An F₁ hybrid between Tift bermudagrass (discovered by J. L. Stephens in an old cotton patch near Tifton, Georgia, in 1929) and a tall-growing introduction from South Africa.

Method of Breeding: Parents were interplanted to allow for maximum natural crossing. Over 5,000 seedling plants were carefully screened for many traits. A few of the best clones were subjected to numerous replicated tests giving measures of their palatability, efficiency, yield potential, management requirements, production under grazing, etc. Tested as No. 99.

Description: Similar to Coastal except it is more erect, makes more open sod, is less weed-resistant, is less tolerant of close grazing, but is more drought resistant and is definitely superior to Coastal bermudagrass in productivity and efficiency of nutrient and water use on deep sands. Released for use on the several million acres of these soils in the South.

Released: 1953, cooperatively by the Georgia Coastal Plain Experiment Station and the Crops Research Division, Agricultural Research Service.

Breeder stock: Georgia Coastal Plain Experiment Station, Tifton, Georgia.

Certified stock: Available in quantity.

Texturf IF

Selected at the Texas Agricultural Experiment Station, College Station, Texas, -- J. R. Watson and E. C. Holt.

Source: Golf course in Dallas - Fort Worth, Texas area. Tested under No. T-35A.

Method of breeding: Vegetative increase of original collection.

Description: Texturf IF is a fine-textured grass having light green color. It produces a dense ground cover that tends to be free of weeds. It is relatively free of unsightly seed stems and makes good spring recovery. Texturf IF is susceptible to leaf diseases and for this reason plantings in the Gulf Coast and East Texas are not recommended. It does not have an extensive root system, so is more susceptible to drouth than common bermudagrass.

Released: 1957, by the Texas Agricultural Experiment Station.

Foundation stock: Foundation Seed Section, Agronomy Department, Texas Agricultural Experiment Station, College Station, Texas.

Certified stock: Available in late 1958.

Texturf 10

Selected at the Texas Agricultural Experiment Station, College Station, Texas, -- J. R. Watson and E. C. Holt.

Source: Corsicana Country Club, Corsicana, Texas. Tested as T-47.

Method of breeding: Vegetative increase of original collection.

Description: Texturf 10 is a medium-textured dark green variety which produces a dense turf. It is relatively free of seed stems and makes early spring recovery and tends toward closer and shorter growth than common bermudagrass. Texturf 10 has better leaf disease resistance than common which results in better color in autumn months. Texturf 10 is sensitive to chlorinated hydrocarbon insecticides, turning a straw color following application of these materials. It recovers in 5 to 7 days with no permanent damage. The grass is slower in producing a cover than common bermudagrass.

Released: 1957, by the Texas Agricultural Experiment Station.

Foundation stock: Foundation Seed Section, Agronomy Department, Texas Agricultural Experiment Station, College Station, Texas.

Certified planting stock: Available in late 1958.

Tiffine

Selected at the Georgia Coastal Plain Experiment Station, Tifton, Georgia; ARS, U.S.D.A., cooperating -- Glenn W. Burton and B. P. Robinson.

Source: An F₁ hybrid between Tiflawn and an African bermudagrass (*Cynodon transvaalensis*) from the East Lakes Golf Course in Atlanta, Georgia.

Method of breeding: Out of extensive crossing efforts involving Tiflawn (*Cynodon dactylon*, 2n = 36) and African (*Cynodon transvaalensis*, 2n = 18), came eight F₁ hybrids (triploids, 2n = 27). These were thoroughly screened under lawn and golf-green management and were compared with superior selections of *Cynodon dactylon* from golf courses. Distributed for testing as Tifton #127.

Description: Tiffine has a lighter green color, more disease resistance, and a much finer texture than common bermudagrass. It is superior for putting greens and fine lawns. It is completely male-sterile, sheds no pollen to annoy hay-fever victims, and must be propagated vegetatively.

Released: 1953, cooperatively by the Georgia Coastal Plain Experiment Station and the Crops Research Division, ARS.

Breeder stock: Georgia Coastal Plain Experiment Station, Tifton, Georgia.

Certified stock: Available in quantity.

Tifgreen

Selected at the Georgia Coastal Plain Experiment Station, Tifton, Georgia; Agricultural Research Service, U.S.D.A., cooperating -- Glenn W. Burton, Jim Latham, and B. P. Robinson.

Source: An F_1 hybrid between a superior clone from a golf green on the Charlotte Country Club, Charlotte, North Carolina, and an African bermudagrass (*Cynodon transvaalensis*) from the East Lakes Golf Course in Atlanta, Georgia.

Method of breeding: Tifgreen is the best of several F_1 hybrids (triploids, $2n = 27$) involving the Charlotte bermudagrass (*Cynodon dactylon*, $2n = 36$) and African bermudagrass ($2n = 18$). It was thoroughly evaluated in comparison with a number of bermudagrasses under golf green management. Tested as Tifton 328.

Description: Tifgreen is darker green and produces a better putting surface than Tiffine. It is similar in other respects and is also being used for fine lawns.

Released: 1956, cooperatively by the Georgia Coastal Plain Experiment Station and the Crops Research Division, Agricultural Research Service.

Breeder stock: Georgia Coastal Plain Experiment Station, Tifton, Georgia.

Certified stock: Available in quantity.

Tiflawn

Selected at the Georgia Coastal Plain Experiment Station, Tifton, Georgia; Agricultural Research Service, U.S.D.A., cooperating -- Glenn W. Burton.

Source: An F_1 hybrid between two selections by-products of the bermudagrass pasture breeding research at the Georgia Coastal Plain Experiment Station, Tifton, Georgia.

Method of breeding: Several hundred F_1 hybrids between a short, dense dwarf selection and a larger disease-resistant type were subjected to a thorough screening, which involved finally evaluating the best under lawn and golf-green management. Tested as Tifton No. 57.

Description: When compared with common bermudagrass, Tiflawn spreads faster, makes denser weed-free turf, is more disease- and frost-resistant, requires less fertilization, and tolerates more wear. It is particularly well suited for heavy-duty turf and is being used on many university football fields in the South.

Released: 1952, cooperatively by the Georgia Coastal Plain Experiment Station, and the Crops Research Division, Agricultural Research Service.

Breeder stock: Georgia Coastal Plain Experiment Station, Tifton, Georgia.

Certified stock: Available in quantity.

Dactylis glomerata L., orchardgrass.

Akaroa

Increased at the Pleasanton Plant Materials Center, SCS, Pleasanton, California.

Source: Introduced from New Zealand.

Description: A low growing, leafy, fine-stemmed, late-maturing strain. Excellent forage production. Seed producing habit is erratic. Lacks winter hardiness. Some seed lots tested in the eastern United States have been relatively early with respect to time of heading and flowering.

Released: Cooperatively by the California Agricultural Experiment Station, and the Plant Materials Center, Pleasanton, California.

Breeder seed: California Agricultural Experiment Station, Davis, California.

Certified seed: Available.

Avon

Selected at Macdonald College, Quebec, Canada.

Source: Strain obtained from Sweden through the Swedish Farmer's Association in 1911.

Method of breeding: Mass selection for winter hardiness.

Description: An early maturing variety, that is characterized by a high level of winter hardiness. It has performed well in areas that have severe winters. No other superior characteristics are claimed for this variety.

Released: Agronomy Department, Macdonald College, Quebec.

Breeder seed: Macdonald College, Quebec.

Certified seed: Not available.

Brage

Developed by the Swedish Seed Association, Svalöf, Sweden.

Source: Single plant selection in material from Germany.

Description: Late, leafy strain that exhibits good winter hardiness and drought resistance in Sweden.

Released: Swedish Seed Association. Has been included in some regional tests.

Certified seed: Not available in the United States.

Finnish late hay

Selected at the University of Massachusetts -- W. C. Colby and Hrant M. Yegian

Source: Obtained from commercial seedsman in Turku, Finland in 1939.

Method of breeding: Limited inbreeding of selected plants, and selection based on polycross progeny performance.

Description: A late-maturing variety (a week to ten days later than common orchardgrass); upright growth habit; leafy (if adequately fertilized with nitrogen); and winter hardy.

Released: Distributed by University of Massachusetts and Eastern States Farmer's Exchange (since 1955).

Breeder seed: University of Massachusetts, Amherst, Massachusetts.

Certified seed: None (in commercial production).

Iowa synthetics

Selected at the Iowa Agricultural Experiment Station, Ames, Iowa, -- R. R. Kalton, M. G. Weiss.

Source: Parental clones selected from long-time stands in fields and roadways in central Iowa and south central Minnesota in 1941 and 1943.

Method of breeding: Large collection of clonal selections evaluated in clonal, inbred, and outcross progeny tests for desirable agronomic traits and combining ability. Clones superior in forage and seed yield, hardiness, recovery, and leafiness were selected for recombination.

Description: Vigorous, productive and winter hardy. Mid-early in maturity. Moderate disease resistance, good seedling vigor, somewhat drought hardy, good in stand establishment and seed yield.

Iowa 1. Recombination of Iowa clone Nos. 58, 60, 64, 120, 123, 149, 158, and 160 from Iowa and 76, 83, and 91 from Minnesota (see source).

Iowa 6. Recombination of Iowa clone Nos. 64, 120, 121, 123 and 160 from Iowa (see source).

Released: Not released but included in regional testing programs starting in 1956.

Breeder seed: Available in limited quantities for testing purposes only from Agronomy Department, Iowa State College, Ames, Iowa.

Ky. Select

Developed at the Kentucky Agricultural Experiment Station, Lexington, Kentucky; -- E. W. Fergus.

Source: Originated on farm of Mr. Fred Stutzenberger, Louisville, Kentucky. This strain had been grown on Mr. Stutzenberger's farm for a number of years.

Description: Highest yielding naturalized strain in tests conducted at Kentucky Agricultural Experiment Station.

Released: Recommended for use and certification by Kentucky Agricultural Experiment Station in 1931.

Certified seed: Available.

Kentucky Synthetic

Selected at the Kentucky Agricultural Experiment Station, Lexington, Kentucky -- R. C. Buckner.

Source: Kentucky naturalized strains.

Method of breeding: Plants selected in 1952 from surviving plants of seven naturalized strains that had been subjected to intensive clipping treatments for three years. The seven strains were the highest yielding entries in tests including approximately 25 naturalized strains. About 400 plants were removed from the plots and isolated for seed increase. The progeny performance of these plants has been equal or superior to the best of the naturalized strains in yield and agronomic performance. Increased for testing as Ky. 79G23-297.

Released: No, included in regional grass tests in 1958.

Breeder seed: Kentucky Agricultural Experiment Station.

Latar

Selected at the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington -- J. L. Schwendiman, R. J. Olson, and A. G. Law.

Source: Original introduction in 1934 from Institute Plant Industry, Leningrad, PI 111,536.

Method of breeding: Grown for three generations in nurseries at the Plant Materials Center; mass selection jointly by SCS and ARS, U.S.D.A., and staff of the Washington Agricultural Experiment Station from spaced plantings in the fourth generation. Tested in uniform nurseries since 1951 as P-2453.

Description: A late maturing hay-type orchardgrass. It blooms and matures seed an average of 10 to 14 days later than commercial varieties. It has abundant broad, well distributed leaves that are noticeably light green in color. Latar is vigorous and high in vegetative production. Seed production is good. Latar is the lowest among seven orchardgrass varieties in lignin content and significantly higher in digestibility.

Released: 1957, cooperatively by the Washington and Idaho Agricultural Experiment Stations, and Aberdeen, Idaho Plant Materials Centers, SCS, U.S.D.A.

Breeder seed: Plant Materials Center, SCS, U.S.D.A., Pullman, Washington.

Certified seed: Limited.

M2 - 111h2

Selected at the Iowa Agricultural Experiment Station in cooperation with the SCS Nursery, Ames, Iowa -- I. J. Johnson and H. E. Heath.

Source: Parental clones selected from long-time stands in fields and roadways in central Iowa and south central Minnesota in 1941.

Method of breeding: From a collection of 100 clones, 10 superior in winter hardiness, disease resistance, clonal yield, and open-pollination progeny performance were selected for recombination.

Description: Moderately productive and winter hardy. Mid-early in maturity. Fair disease resistance. Moderate seedling vigor, drought resistance, and seed yield. A recombination of Iowa clones Nos. 13, 45, 54, 58, 60, 64, 66 and 93 from Iowa and 82 and 91 from Minnesota (see source).

Released: Not released but included in regional testing program starting in 1952.

Breeder seed: No longer available. Small amounts of seed were produced by SCS Nursery at Ames and Ankeny from 1945-1953.

Certified seed: Not available.

New York synthetics

Synthetic D

Selected at Cornell University, Ithaca, New York -- R. P. Murphy.

Source: Selected from a large group of clones originally selected at U. S. Regional Pasture Research Laboratory from a wide collection of seed lots. Parental clones: Pasture Laboratory N.Y. 49-108(XLI-17), N.Y. 49-119(MXII-6 XXXVIII-2), N.Y. 49-121(MXII-8 XXXVIII-25), and N.Y. 47-260(MIV-6).

Method of breeding: Synthetic variety developed from 4 selected clones.

Description: A late maturing variety selected for vigor, quick recovery, and resistance to foliar diseases.

Released: No, to be continued under test.

Synthetic E

Selected at Cornell University, Ithaca, New York -- R. P. Murphy.

Source: Selected from a large group of clones originally selected at U. S. Regional Pasture Research Laboratory from a wide collection of seed lots. Parental clones: Pasture Laboratory N.Y. 49-107(XLI-13), N.Y. 49-127(MXII-14 AIV-21), N.Y. 49-134(XLII-1), and N.Y. 49-135(XLII-4).

Method of breeding: Synthetic variety developed from 4 selected clones.

Description: A very late maturing variety selected for vigor, erect growth habit, and resistance to foliar diseases. It is somewhat light green in color in the spring and fall and starts growth later in the spring and stops growth earlier in the fall than earlier maturing varieties.

Released: No, to be continued under test. (Consideration has been given to release of this variety under the name Aurora. However, because of low seed production it probably will not be released.)

Oregon 233

Selected at the Oregon Agricultural Experiment Station; Agricultural Research Service, USDA, cooperating - H. A. Schoth.

Source: Increase of "selected grazing strain No. 233" obtained from Gartons, Ltd., Warrington, England, in 1936 as FC 22,364.

Description: Differs from common in being finer and denser of leaf, higher in forage yield and lower in seed yield.

Released: No, included in regional tests for several years before it was discontinued.

Breeder seed: Not available.

Palestine

Increased at the California Agricultural Experiment Station, Davis, Calif.

Source: Received in 1947 from G. L. Stebbins. Seed received from Samaria, Daliah, Palestine.

Description: It is a stronger winter grower and a lighter forage producer than common. It is drought resistant but lacking in winter hardiness.

Released: No, included in some regional tests.

Breeder seed: California Agricultural Experiment Station.

Pasture Laboratory Experimental Synthetics, 1 through 7

Selected at U. S. Regional Pasture Research Laboratory, University Park, Pennsylvania -- W. M. Myers.

Source:

Syn. #1 (Collections made in Virginia, Maryland and Pennsylvania).
Syn. #2 (Collections made in Pennsylvania and Maryland and Canadian accession).
Syn. #3 (Collections made in Vermont and Canadian accession).
Syn. #4 (Collections made in Pennsylvania, New York and Maryland, also varieties Roskilde and Minerva).

Syn. #5 (Tammisto, Tardus #2, and Skandia II).
Syn. #6 (Tammisto, Tardus #2, and "Swedish Select grazing").
Syn. #7 (Selected from O.P. progenies at SCS Nursery, Big Flats, New York. SCS accession numbers lost in fire).

Method of breeding: Selections evaluated in series of replicated polycross nurseries. Thirty-eight clones isolated on basis of clonal performance and observational data obtained from polycross progenies.

Description: Plants selected on basis of winter hardiness, disease resistance, plant type, recovery following mowing and leafiness were arranged in 7 synthetics according to maturity.

Syn. #1 (7 clones: MI-13, MI-14, MI-16, MI-17, MII-30, MII-34, MII-36) Av. heading date 5/31.

Syn. #2 (5 clones: MI-19, MI-20, MII-18, MII-29, MII-56) Av. heading date 6/1.

Syn. #3 (4 clones: MI-15, MI-46, MII-49, MII-50) Av. heading date 6/3.

Syn. #4 (6 clones: MIII-8, MIII-18, MIII-20, MIII-21, MIII-22, MIII-24) Av. heading date 6/6.

Syn. #5 (5 clones: MIV-5, MIV-6, MIV-11, MIV-14 and MIV-16)

Syn. #6 (3 clones: MIV-14, MIV-17, MIV-18) Av. heading date 6/10.

Syn. #7 (8 clones: XLI-6, XLI-8, XLI-13, XLI-17, XLI-23, XLI-24, XLII-1, XLII-4) Av. heading date 6/12.

Released: No, included in regional testing program. Some clones included in new synthetics developed at Pennsylvania State University and Cornell University.

Breeder seed: Not available. Some clones available at the New York and Pennsylvania Agricultural Experiment Station.

Pennlate

Selected at Pennsylvania Agricultural Experiment Station, University Park, Pennsylvania in cooperation with U.S. Regional Pasture Research Laboratory -- H. R. Fortmann and H. L. Carnahan.

Source: Clone M IV-5 (from Pasture Laboratory Synthetic V), clone M IV-17 (P.L. Syn. VI) and clones XLI and XLII (P.L. Syn. VII).

Method of breeding: Four clone synthetic, developed from tests including seven Pasture Laboratory Experimental synthetics and polycross progenies of component clones. Restricted polycross progenies tested in New York and Pennsylvania. Strain included in testing programs as Pennsylvania Late Synthetic III.

Description: Vigorous, persistant, late maturing variety. Produces higher yields and recovers better than other late maturing types.

Released: 1957, Pennsylvania Agricultural Experiment Station.

Breeder seed: Pennsylvania Agricultural Experiment Station, University Park, Pennsylvania.

Certified seed: Not available.

Pennsylvania synthetics

Early I Medium II

Developed at Pennsylvania Agricultural Experiment Station, University Park, Pennsylvania in cooperation with U. S. Regional Pasture Research Laboratory -- H. R. Fortmann and H. L. Carnahan.

Source: Early synthetic I (clover MI-14, MII-34 and MII-36 from Pasture Laboratory Syn. I, and clone MII-56 from P.L. Syn. II)

Medium synthetic II (clones MIII-8, MIII-18, MIII-20 and MIII-24 from Pasture Laboratory Syn. IV)

Method of breeding: Four clone synthetics, developed from tests including seven Pasture Laboratory Experimental Synthetics and polycross progenies of component clones. Restricted polycross progenies tested in New York and Pennsylvania.

Description: Vigorous persistent strains. Original selections made on basis of winter hardness, disease resistance, plant type, recovery following mowing and leafiness.

Released: No, in regional testing program.

Breeder seed: Pennsylvania Agricultural Experiment Station, University Park, Pennsylvania.

Potomac

Selected at Plant Industry Station, Beltsville, Maryland - R. E. Wagner, M. A. Hein, and F. R. Henson.

Source: Plants collected in 1935 from old pastures in Maryland, Virginia, West Virginia and Pennsylvania and from strain tests conducted at the Plant Industry Station.

Method of breeding: Collections screened on basis of type, rust resistance, leafiness, persistence and vigor, and in 1940, eight plants of predominately pasture type were placed in one isolation block (Maryland pasture strain) and six plants representing erect hay types were placed in another (Maryland hay strain). In 1945, plants were selected from three year old broadcast plots of these two strains and established in a space planted nursery together with an equal number of seedlings from each of the two strains. The nursery was rogued and bulk seed collected for testing as Beltsville orchardgrass. Potomac represents the third cycle of mass selection from 1945 nursery.

Description: Dark green, leafy, erect variety similar to commercial lots in height. A productive variety characterized by superior persistence and rust resistance.

Released: 1955, Crops Research Division, ARS and cooperating Experiment Stations.

Breeder seed: Plant Industry Station, Beltsville, Maryland.

Certified seed: Limited supply.

S-37

Selected at the Welsh Plant Breeding Station, Aberystwyth, Great Britain.

Source: Initial plant material selected on basis of type rather than origin.

Description: A hay type. Basic type plants are relatively erect and well leaved up the stems, giving more leafy hay than Danish. Late maturing variety that performs very satisfactorily in association with legumes. It has shown some evidence of lack of persistence in the eastern United States.

Released: Welsh Plant Breeding Station. Included in regional grass tests in the United States.

Certified seed: Available from Great Britain. Certified seed produced in Idaho.

S-143

Selected at the Welsh Plant Breeding Station, Aberystwyth, Great Britain.

Source: Based on indigenous plant of a rather extreme type which was designated "mop" cockfoot owing to the dense broad cushions produced by individual spaced plants.

Method of breeding: Variety has been reselected. New lots exhibit greater uniformity with respect to late maturity and prostrate growth habit.

Description: Late maturing pasture type; plants relatively spreading with profusion of tillers and broad leaves.

Released: Welsh Plant Breeding Station. Included in regional grass tests in the United States.

Certified seed: Available from Great Britain. (Certified seed produced in several western states.)

Sandia

Selected at SCS Nursery, Albuquerque, New Mexico.

Source: A-10655. Selected plants from "Brage" NY-NI-25969, SCS Nursery, Big Flats, New York.

Method of breeding: Selected more robust, disease free plants from 50 row foot planting. Plants dug and isolated for seed increase.

Description: Large robust plant that grows well with alfalfa. Good seed producer and apparently rust free.

Released: 1953, cooperatively by the New Mexico Agricultural Experiment Station, and Nursery Division, SCS.

Breeder seed: SCS-N.M. Cooperative Nursery.

Certified seed: Available.

Trogon

Selected at Missouri Agricultural Experiment Station, Columbia, Missouri, ARS, U.S.D.A. Cooperating - E. Marion Brown.

Source: A total of 344 plants were selected in 1936 from sparse stand in a 1/4 year old field near Springfield, Missouri. Also plants from bluegrass lawn in Columbia, Missouri.

Method of breeding: Source material transplanted on one foot centers and mowed semi-monthly to height of one inch through 1937 and 1938. Twenty-four plants selected on basis of recovery after each cutting, and size and vigor at end of two-year period of close defoliation. Selections transplanted to crossing blocks-- seed composited and used to establish increase block.

Description: Vigorous, persistent variety not visibly distinguishable from commercial. Susceptible to leaf rust.

Released: No, in regional grass testing program.

Breeder seed: Variety will be discontinued.

Certified seed: None.

Utah Synthetic

Selected at the Utah Agricultural Experiment Station, Logan, Utah, ARS, U.S.D.A. Cooperating - Wesley Keller.

Source: Developed from selections made in controlled competition studies at the Forage Experiment Farm, Logan, Utah.

Method of breeding: Selection of 17 late flowering plants from a group of 50 that had been chosen for high yield and good recovery from 1400 plants grown under conditions of controlled competition. The number of clones was later reduced to 14, which were planted in isolation in a restricted poly-cross block to produce seed. Utah Syn-2 is simply the second synthetic generation of this same material.

Description: Uniformly late, dark green with rather narrow leaves. Forage yield under irrigated conditions compares favorably with strains of similar maturity.

Released: No, included in regional grass testing programs.

Breeder seed: Utah Agricultural Experiment Station, Logan, Utah.

Washington H-2

Selected at the Western Washington Agricultural Exp. Sta., Puyallup, Wash.

Method of breeding: Two relatively infertile parent plants were increased vegetatively and interplanted under isolation to produce the F₁ seed designated as Hybrid 2. The two unrelated parent plants each had a background of 4 generations of selfing.

Description: Hybrid 2 is slightly shorter than common when fully developed. It is about 20 days later than common and appears suitable for use in mixtures. It is leafy and produces good yields of seed.

Released: No, included in regional tests for several years before it was discontinued.

Breeder seed: Not available.

Washington 88

Selected at the Western Washington Agricultural Experiment Station, Puyallup, Washington.

Method of breeding: Sibs of a single plant selected after 3 generations of self pollination. These sibs were planted under isolation and the seed produced from this mass seeding provided foundation stock for Washington 88. Strain lost during World War II, and subsequently re-established with selections from foundation field.

Description: About 10 days later than common, and with less variation between individual plants. Leafier, and almost as tall as common.

Released: No, included in regional tests for several years before it was discontinued.

Breeder seed: Not available.

Wisconsin 52

Selected at the Wisconsin Agricultural Experiment Station, Madison, Wisconsin.

Source: Seed collections obtained in 1941 from 13 colonies throughout the State from near Chicago northward to Ashland.

Method of breeding: Spaced plants established from collections in spring of 1942. Progenies left in field for 3 winters and rogued of stemmy, non-leafy, and severely diseased plants. Remaining plants allowed to interpollinate, and mass seeded rows established in 1945. Very winter hardy in Wisconsin, otherwise similar to common.

Released: No, included in regional tests.

Breeder seed: Wisconsin Agricultural Experiment Station.

Certified seed: None.

Digitaria decumbens Stent, pangolagrass.

Pangolagrass

Increased at the Florida Agricultural Experiment Station, Gainesville, Florida; Agricultural Research Service, U.S.D.A., cooperating -- George Ritchey.

Source: P.I. 111,110 vegetative planting material received from South Africa in 1935.

Testing: Plots and pastures 1941-42.

Description: Similar to Digitaria sanguinalis crabgrass except is perennial and vigorously stoloniferous. Strictly a warm weather grass for pastures, hay or silage. Does not produce seed and is propagated vegetatively. Adapted to the peninsular area of Florida. Susceptible to winter killing in north Florida.

Released: 1944, cooperatively by the Florida Agricultural Experiment Station and the Crops Research Division, Agricultural Research Service.

Seed: Vegetative planting stock available during the growing season.

Elymus canadensis L., Canada wildrye.

Mandan Wildrye

Selected at U. S. Northern Great Plains Field Station, Mandan, North Dakota - George A. Rogler.

Source: Field collection made near Mandan, North Dakota in 1935.

Method of breeding: Mass selection within two single plant progenies and distributed as Mandan 419.

Description: More and softer textured leaves, shorter culms, and longer-lived than ordinary Canada wildrye.

Released: 1946, cooperatively by the North Dakota Agricultural Experiment Station, and the Crops Research Division, ARS.

Breeder seed: U. S. Northern Great Plains Field Station, Mandan, North Dakota.

Certified seed: Not available.

M2-111108

Selected at the Iowa Agricultural Experiment Station in cooperation with the SCS Nursery, Ames, Iowa. |- I. J. Johnson, M. E. Heath.

Source: Originated as seed increase under isolation of single plant selection made southwest of Des Moines, Iowa in 1940.

Method of breeding: From about 100 plants selected from long-time stands in Iowa in 1940, one plant (Clone No. 361) was saved for increase purposes. All selections were selfed and evaluated clonally. Clone No. 361 was considered superior and seed increase was started in 1942. Several subsequent generations of seed increase made by SCS Nursery at Ames and Ankeny, Iowa.

Description: Uniform, leafy, vigorous strain 10 days or more later in heading than Mandan wildrye. Disease resistant and good seedling vigor. Has not been thoroughly tested for agronomic merit.

Released: No.

Breeder seed: In limited amounts from SCS Plant Materials Center, Elsberry, Missouri.

Certified seed: Not available.

Elymus cinereus Scribn. & Merr., giant wildrye.

P-5797

Selected at the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington -- J. L. Schwendiman.

Source: University of Sask. Saskatoon, Saskatchewan, Canada, in 1938.

Method of breeding: Selection of vigorous types during several generations.

Description: A robust, vigorous, blue, tall growing, leafy strain. Has broad coarse leaves, large stems and seed heads and is good in seed production. Seed grows readily and has good seedling vigor. Grows well on saline and high pH soils.

Released: No, included in tests.

Breeder seed: Plant Materials Center, SCS, U.S.D.A., Pullman, Washington.

Certified seed: Not available.

Elymus giganteus Vahl, Siberian wildrye.

Volga

Selected at the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington.

Source: PI 108491. Lower Volga region USSR, introduced by the Westover-Enlow Expedition in 1934. Propagated and tested as P-208.

Method of breeding: Selection of the most vigorous plants from the above introduction during several generations followed by vegetative reproduction of the most desirable type.

Description: A tall, coarse, green, creeping strain non-palatable to livestock, long-lived on inland sand dunes where it will stop sand movement and provide permanent cover. Can be grown from seed or propagated vegetatively. The rate of increase from culms under proper cultural conditions is 15: 1 in the first year. When established from seed, seedlings show excellent vigor.

Released: Vegetative material distributed in 1949 for inland dune control, by Plant Materials Center, SCS, U.S.D.A., Pullman, Washington. Seed not released.

Breeder seed: Vegetative material and seed from bulked selections, Plant Materials Centers, SCS, U.S.D.A., Pullman, Washington and Aberdeen, Idaho.

Certified seed: None, material available for vegetative plantings.

Elymus glaucus Buckl., blue wildrye.

Lomasgrass

Selected at the Plant Materials Center, SCS, U.S.D.A., Pleasanton, California -- Paul B. Dickey and Oswald K. Hoglund.

Source: Collected from native stand in winter-annual rangeland near Sebastopol, California in 1935.

Method of breeding: Green glabrous plants selected for field seeding and given SCS accession number P-10128. This selection was outstanding among 129 collections of blue wildrye. It was improved by mass selection for several generations and tentatively named Lomasgrass.

Description: An early-maturing, long-lived, low fertility level, perennial bunchgrass. It is bright green in color, forms an open bunch, and its leaves are of medium width. On rangeland sites to which it is adapted, it has good seedling vigor, begins growth early in the fall, develops rapidly during the winter, and remains green 2 to 4 weeks after the annuals dry up. Moderate grazing is essential to maintenance of stands.

Released: No, included in tests on annual range area of California

Breeder seed: Plant Materials Center, SCS, U.S.D.A., Pleasanton, California.

Certified seed: Not available.

Elymus junceus Fisch., Russian wildrye.

A-2514

Produced at SCS Nursery, Albuquerque, New Mexico.

Source: BPI Station, Mandan, North Dakota 1935. A-2514.

Method of breeding: None. Bulk increase.

Description: Variable population. Fair to good seed producer but subject to an unknown blight that attacks the base of the seed stalks causing them to fall prior to seed set. Forage production as good as any other accession tested.

Released: Being certified by Colorado A&M.

Breeder seed: None.

Certified seed: Available in limited amounts from seed growers in Colorado.

Mandan D-19 (Commercial)

Developed at U. S. Northern Great Plains Field Station, Mandan, North Dakota -- George A. Rogler.

Source: Increase of P.I. 75,737 received in 1927 from Western Siberian Experiment Station, Omsk. (Original recorded introduction)

Method of breeding: Best among several other introductions up to 1940.

Description: Typical of E. junceus introduced from the USSR. Will probably be replaced by newer varieties, e.g., Mandan 2355.

Released: Distributed to other experiment stations, and widely grown in United States.

Breeder seed: No longer available.

Certified seed: Available in quantity, most often certified as commercial.

Mandan 2355

Selected at U.S. Northern Great Plains Field Station, Mandan, North Dakota -- George A. Rogler.

Source: The five parental clones represent three separate introductions from the U.S.S.R.

Method of breeding: A synthetic of five unrelated clones. At least four generations of selection on a single plant basis in open pollinated and inbred lines preceded the choice of each parent. Progeny tests in yield plots and as spaced plants were used to measure the effects of outcrossing with the other four plants for each plant in the synthetic. All five clones are good seed producers and three of them produce exceptionally large seed.

Description: Forage yields equal to commercial. Has yielded 75% more seed than commercial in tests conducted over a five-year period. Weight per bushel of seed and weight of 200 seeds have also been slightly higher than those of commercial.

Released: Will probably be released in 1958 in cooperation with North Dakota Agricultural Experiment Station, Fargo, North Dakota.

Breeder seed: U. S. Northern Great Plains Field Station, Mandan, North Dakota.

Certified seed: Will probably not be available until 1960.

Eragrostis chloromelas Steud., Boer lovegrass.

A-84

Increased at the SCS Nursery at Tucson, Arizona -- C. G. Marshall and L. P. Hamilton.

Source: Union of South Africa.

Released: 1950, cooperatively by Arizona Agricultural Experiment Station and the Nursery Division, SCS.

Breeder seed: Arizona Plant Materials Center, Tucson, Arizona.

Certified seed: Limited.

A-12752

Increased at the SCS Nurseries at Albuquerque, New Mexico and Tucson, Arizona -- C. G. Marshall, T. F. Spallér and L. P. Hamilton.

Source: Received as Eragrostis curvula var. ampla.

Method of breeding: Mass selection practiced for bluish type.

Description: A vigorous strain of Boer lovegrass. Heads have more dense panicle branches than A-84. Equally cold hardy.

Released: No.

Breeder seed: Arizona Plant Materials Center, Tucson, Arizona.

Certified seed: None.

Oklahoma 4880

Increased at the Oklahoma Agricultural Experiment Station, Stillwater, Oklahoma, ARS, U.S.D.A., cooperating -- J. R. Harlan.

Source: A-12751 from the former SCS Nursery at Albuquerque, New Mexico. This lot is probably the same as the one that has been tested in western Oklahoma since 1948.

Description: More cold tolerant than most accessions of this species; drought tolerance suggests that it may be useful in parts of the southwest.

Released: No, increased for testing only

Eragrostis lehmanniana Nees, Lehmann lovegrass.

A-68

Increased at the Soil Conservation Service Nursery, Tucson, Arizona -- C. G. Marshall.

Source: Seed sent to F. J. Crider by M. Willman, Kimberley, Union of South Africa.

Description: Seedlings volunteer and tolerate adverse conditions better than other lovegrasses. More drought tolerant but less cold tolerant than Boer or weeping lovegrass.

Released: 1950, cooperatively by Arizona A.E.S. and The Nursery Division, Soil Conservation Service.

Breeder seed: University of Arizona Plant Materials Center.

Certified seed: Not available.

Cold Hardy Lehmann

Increased at the Soil Conservation Service Nurseries at Albuquerque, N. M. and Tucson, Arizona -- L. P. Hamilton and T. F. Spaller.

Source: A-14108 represents mixed seed of PI 165,734 and SPI 092,037 produced at the Southern Great Plains Field Station, Woodward, Oklahoma. A-14107 was designated as first cold hardy strain received from U.S.D.A. A-14108 and A-14107 were bulked at Tucson.

Description: Plants resemble A-68, but have denser basal leaf development. Panicle is shorter and more densely branched. There is less tendency for stolons. Seedlings develop less rapidly as in Boer lovegrass. Plants are more cold hardy than A-68, being equal to Boer lovegrass. Seed fill was good at Albuquerque and Snowflake, but poor at Tucson.

Released: No

Breeder seed: University of Arizona, Plant Materials Center.

Certified seed: None.

Hardy Lehmann

Increased at the U. S. Southern Great Plains Field Station, Woodward, Oklahoma in cooperation with the Oklahoma Agricultural Experiment Station -- J. R. Harlan.

Source: Unnumbered accession obtained in 1947; 19 plants set out in 1948 and seed of survivors increased. Seed was sent to the SCS Nursery at Albuquerque where it overwintered in contrast to other strains of the same species.

Description: This strain is hardier than most, and proved remarkably drought resistant in western Oklahoma tests during the great drought of the 1950's.

Released: No.

Breeder seed: Small increase block maintained by Oklahoma Agricultural Experiment Station.

Kalahari

Increased at the Soil Conservation Service Nursery, Tucson, Arizona -- L. P. Hamilton and Darwin Anderson.

Source: From Kalahari desert, South Africa, introduced on PI 198,581. Included in testing program as A-14328.

Description: A more productive strain than A-68, when moisture is available. Slightly taller, but no leafier than A-68 when grown under moisture stress; strains similar in other respects.

Released: No.

Breeder seed: University of Arizona, Plant Materials Center.

Certified seed: None.

Eragrostis trichodes (Nutt.) Wood, sand lovegrass.

A-11527

Produced in quantity at SCS Nursery, Albuquerque, New Mexico.

Source: Received originally from SCS Nursery, Woodward, Oklahoma. Probably a southern Kansas source. A-11527.

Method of breeding: None. Bulk increase. In 1949 a field selection of early maturing plants was made near Haxtun, Colorado. This lot was labeled A-11527 M-I, R1 and is two weeks earlier in seed maturity than bulk. Forage production first year is superior to any northern strains tested.

Description: Original bulk production is a good southern strain adapted to eastern New Mexico, central and southeastern Colorado. Will not mature a satisfactory seed crop in northeastern Colorado.

Released: 1940, in cooperation with New Mexico Agricultural Experiment Station, State College, New Mexico.

Breeder seed: SCS-N.M. Cooperative Nursery.

Certified seed: Limited.

Nebraska 27

Developed at the Nebraska Agricultural Experiment Station, Lincoln, Nebraska, in cooperation with the ARS and the SCS, U.S.D.A., -- L. C. Newell and E. C. Conard.

Source and Method of Selection: Selected plants from a native meadow in northern Holt County, Nebraska, were moved to a Lincoln Nursery in 1935 by L. C. Newell and Elver Hodges. Seed from these plants was later increased at the North Platte and Waterloo nurseries by E. C. Conard.

Description: Nebraska 27 is a winter-hardy, relatively long-lived strain of sand lovegrass. In Nebraska plantings it has survived and maintained stands superior to plantings made with seed from more southern sources. It is well adapted to a range of soil types. Application of phosphorous fertilizers to sandy soils of low fertility will usually increase the yields of forage and seed. Sand lovegrass produces highly palatable nutritious forage. It is best used in mixtures with other warm-season native grasses such as the gramas or bluestems.

Released: 1949, cooperatively by the Nebraska Agricultural Experiment Station, the Crops Research Division, ARS, and the Nursery Division, SOS.

Foundation seed: Foundation Seed Division, Department of Agronomy, Nebraska Agricultural Experiment Station, Lincoln, Nebraska.

Certified seed: Available.

Woodward strains

Selected at the U. S. Southern Great Plains Field Station, Woodward, Oklahoma; in cooperation with the Oklahoma Agricultural Experiment Station -- J. R. Marlan.

Five lines have been distributed over the years. W2 and W5 were taken to El Reno for more extensive testing. W2 proved to be far inferior in both forage and seed to W5 which is now being compared to common for seed production. Unless W5 turns out to be a better seed producer than common, we believe that none of these strains is an improvement. W5 is available in considerable quantities; the others have been dropped.

W1: Original field selection by Jack E. Engleman, later reselected. A tall, vigorous, large seeded type which is somewhat shatter resistant.

W2: Selection No. 45-5343. A short selection which, on poor soil, retains a dark green color when other strains show some chlorosis. Deeply pigmented panicles.

W3: Selection No. 45-5350. A leafy strain of medium height, open purple panicle, a good seed producer.

W4: Selection No. 45-5344. A leafy selection of medium height and a good seed producer.

W5: Recombines five plants from a single plant selection family (85-5088-92 incl.). Tall, vigorous, leafy, dark green type.

Festuca arundinacea Schreb., tall fescue.

Alta

Selected at Oregon State College, Corvallis, Oregon; Agricultural Research Service, USDA cooperating - H. A. Schoth.

Source: In 1918 some of the more promising lines of tall fescue from a nursery at Pullman, Washington, were established at the Oregon Experiment Station, Corvallis, Oregon. The seed was obtained from Max Heinricks, Pullman, Washington. The three lines used were P.I. 19728, P.I. 24838, and P.I. 25206. P.I. 19728 was received January 24, 1907 by plant introduction from the A. LeCoq & Company, Darmstadt, Germany. P.I. 24838 was from a commercial lot of about 500 pounds of seed purchased from the J.C. Peppard Company, Kansas City, Missouri, March 9, 1909. P. I. 25206 was from a lot of seed presented by Dr. George Bitter, director of the botanic garden, Bremen, Germany. This lot was received by the Plant Introduction Section March 26, 1909.

Method of breeding: This variety evolved as an ecotype selection. The material mentioned above was planted in the spring of 1918. It was noted to have made exceptionally fine growth during the first season. It was of sufficient interest to receive special mention in annual reports during 1919, 1920, 1921

and 1922. In the winter of 1922-1923 it suffered severe winter killing. The surviving plants were put together and became the source seed of selection number 7. In 1927 the designation of selection number 7 was changed to FC 29366. It remained under this particular selection number until it was given the name Alta in 1940. It was recognized for its ability to remain green during the dry summers experienced in western Oregon and because of its high yields of forage.

Released: 1940, cooperatively by the Oregon Agricultural Experiment Station and the Crops Research Division, Agricultural Research Service.

Breeder seed: Oregon Agricultural Experiment Station, Corvallis, Oregon.

Certified seed: Available in quantity.

Alta 144

Increased by the Charles H. Lilly Seed Company, Seattle, Washington.

Source: Origin is obscure, but is believed to trace to Alta tall fescue seed obtained from Corvallis, Oregon.

Certified seed: None. (strain is no longer in commercial production).

Alta 4-36

Selected at the Oregon Agricultural Experiment Station, Corvallis, Oregon; Agricultural Research Service, USDA, cooperating - H. A. Schott and H. H. Rampton.

Source: Alta tall fescue.

Method of breeding: Fifty selections from the Alta variety. Selections grown under isolation and outstanding individuals selected from the resulting progenies.

Description: More dense than Alta, with finer leaf. It is approximately equal to Alta in forage yield and crude protein content but is lower in seed yield.

Released: No, included in regional tests.

Breeder seed: Oregon Agricultural Experiment Station.

Asheville

Source: Collection from naturalized stand 5 miles southwest Asheville, North Carolina 6-27-4 by Paul Tabor. Grown under experimental number SC 20-764.

Description: A strain of tall fescue, more stable to adverse changes in environment than Ky. 31 or Alta. The yield is not greater than that of Ky. 31 or Alta. The minimum cold required is somewhat greater. Asheville fescue has been observed superior to other kinds on soils that become too wet in winter, and on rich soils during the cold of winter.

Released: No formal release. Seed distributed from SCS Nursery, Americus, Georgia 1952.

Breeder seed: None.

Certified seed: None.

A small area for seed production is being maintained on the Americus Nursery, John D. Powell, Superintendent, Americus, Georgia.

Goar

Selected at the Imperial Valley Experiment Station, El Centro, California --
L. G. Goar.

Source: Original material came from D. Dagan of Budapest to Professor Southworth
of the University of Manitoba. It was received by Professor P. B. Kennedy of the
University of California in March, 1925.

Method of breeding: Planted at El Centro, California, in 1941 and tall fescue
types selected. Seed of this type was received from Professor Goar by the Pleasanton
Plant Materials Center and assigned accession number P-13,047. Tested at the
Pleasanton Plant Materials Center, SCS, U.S.D.A., in cooperation with the
University of California Agricultural Experiment Station since 1946.

Description: An early-maturing, vigorous, rather coarse, high fertility level,
bunchgrass. It has strong seedling vigor, is well adapted to heavy-textured alkali
soils, and grows better during periods of high summer temperature than do other
strains of tall fescue.

Released: Certified by the California Crop Improvement Association in 1946.

Foundation seed: California Crop Improvement Association and the Pleasanton Plant
Materials Center, Pleasanton, California.

Certified seed: Available.

Kentucky-31

Selected at the Kentucky Agricultural Experiment Station, Lexington, Kentucky--
E. N. Fergus.

Source: William Suiter's farm in Menifee County, Kentucky. Collected by
E. N. Fergus in 1931 for testing at the Kentucky Agricultural Experiment Sta-
tion. The grass had apparently been grown on Mr. Suiter's farm since 1887.

Description: Wide adaptation to soil types and temperature extremes. Suited
to the upper South where it remains green all year with occasional exception
of midsummer months. Very productive but not too palatable. Excellent for
erosion control.

Released: Kentucky Agricultural Experiment Station.

Certified seed: Available in quantity.

Ky. 59 GL-32

Developed at the Kentucky Agricultural Experiment Station, Lexington, Ky.
-- E. N. Fergus and R. C. Buckner.

Source: A naturalized variety from southeastern Kentucky.

Description: Similar in appearance to Ky. 31, but appears to develop a sod
that is somewhat more dense. It has produced slightly higher yields than
Ky. 31 especially in older stands.

Released: No, included in regional testing program.

Breeder seed: Kentucky Agricultural Experiment Station, Lexington, Kentucky.

Certified seed: None.

Increased by Soil Conservation Service Nurseries.

Source: Roadside collection Haywood Company, North Carolina by W. H. Rankin (N. C. A. E. S.) in 1940 (approximately).

Description: More prostrate and later by 7 to 10 days than either Ky 31 or Alta. Reported to be inferior south of North Carolina to other varieties of tall fescue.

Released: Distributed by Plant Materials Centers, SCS, for testing purposes.

Breeder seed: Not available except for a few grams of seed at the North Carolina Agricultural Experiment Station, Raleigh, North Carolina.

Certified seed: None.

New Zealand

Increased at Kansas Agricultural Experiment Station, Manhattan, Kansas.

Source: Seed collected from individual plants in New Zealand, and sent to Kling Anderson, Manhattan, Kansas.

Description: Very late, coarse type.

Released: No, included in regional testing program.

Breeder seed: Maintained at Plant Industry Station, Beltsville, Maryland.

Tennessee strains

Selected at the Tennessee Agricultural Experiment Station, Knoxville, Tenn. - J. K. Underwood.

Source: Ky. 31 tall fescue.

Method of breeding: Inbred 2 years and strains having similar characteristics crossed by transplanting side-by-side, and either caging or bagging.

Description: (a) Fine-leaved type, leafy and productive. Has not been submitted to palatability test.

(b) Low silicon line (0.97%) - leaves very long, broad, flagged, early heading, very productive.

(c) High silicon line (1.28%) - leaves narrower, stiff pointed, not flagged, 7-10 days later than (b) in heading and ripening of seed.

Released: No, seed not available at present for testing purposes.

Festuca idahoensis Elmer, Idaho fescue.

P-6135

Selected at the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington -- R. J. Olson and J. L. Schwendiman.

Source: Collected from the native Ponderosa pine - grassland association near Winchester, Idaho by Donald Hedrick in 1938.

Method of breeding: The accession was outstanding among 61 collections. It was improved by mass selection during several generations.

Goar

Selected at the Imperial Valley Experiment Station, El Centro, California --
L. G. Goar.

Source: Original material came from D. Dajen of Budapest to Professor Southworth
of the University of Manitoba. It was received by Professor P. B. Kennedy of the
University of California in March, 1925.

Method of breeding: Planted at El Centro, California, in 1941 and tall fescue
types selected. Seed of this type was received from Professor Goar by the Pleasanton
Plant Materials Center and assigned accession number P-13,847. Tested at the
Pleasanton Plant Materials Center, SCS, U.S.D.A., in cooperation with the
University of California Agricultural Experiment Station since 1946.

Description: An early-maturing, vigorous, rather coarse, high fertility level,
bunchgrass. It has strong seedling vigor, is well adapted to heavy-textured alkali
soils, and grows better during periods of high summer temperature than do other
strains of tall fescue.

Released: Certified by the California Crop Improvement Association in 1946.

Foundation seed: California Crop Improvement Association and the Pleasanton Plant
Materials Center, Pleasanton, California.

Certified seed: Available.

Kentucky-31

Selected at the Kentucky Agricultural Experiment Station, Lexington, Kentucky--
E. N. Fergus.

Source: William Suiter's farm in Menifee County, Kentucky. Collected by
E. N. Fergus in 1931 for testing at the Kentucky Agricultural Experiment Sta-
tion. The grass had apparently been grown on Mr. Suiter's farm since 1887.

Description: Wide adaptation to soil types and temperature extremes. Suited
to the upper South where it remains green all year with occasional exception
of midsummer months. Very productive but not too palatable. Excellent for
erosion control.

Released: Kentucky Agricultural Experiment Station.

Certified seed: Available in quantity.

Ky. 59 Gl-32

Developed at the Kentucky Agricultural Experiment Station, Lexington, Ky.
-- E. N. Fergus and R. C. Buckner.

Source: A naturalized variety from southeastern Kentucky.

Description: Similar in appearance to Ky. 31, but appears to develop a sod
that is somewhat more dense. It has produced slightly higher yields than
Ky. 31 especially in older stands.

Released: No, included in regional testing program.

Breeder seed: Kentucky Agricultural Experiment Station, Lexington, Kentucky.

Certified seed: None.

Increased by Soil Conservation Service Nurseries.

Source: Roadside collection Haywood Company, North Carolina by W. H. Rankin (N. C. A. E. S.) in 1940 (approximately).

Description: More prostrate and later by 7 to 10 days than either Ky 31 or Alta. Reported to be inferior south of North Carolina to other varieties of tall fescue.

Released: Distributed by Plant Materials Centers, SCS, for testing purposes.

Breeder seed: Not available except for a few grams of seed at the North Carolina Agricultural Experiment Station, Raleigh, North Carolina.

Certified seed: None.

New Zealand

Increased at Kansas Agricultural Experiment Station, Manhattan, Kansas.

Source: Seed collected from individual plants in New Zealand, and sent to Kling Anderson, Manhattan, Kansas.

Description: Very late, coarse type.

Released: No, included in regional testing program.

Breeder seed: Maintained at Plant Industry Station, Beltsville, Maryland.

Tennessee strains

Selected at the Tennessee Agricultural Experiment Station, Knoxville, Tenn. - J. K. Underwood.

Source: Ky. 31 tall fescue.

Method of breeding: Inbred 2 years and strains having similar characteristics crossed by transplanting side-by-side, and either caging or bagging.

Description: (a) Fine-leaved type, leafy and productive. Has not been submitted to palatability test.

(b) Low silicon line (0.97%) - leaves very long, broad, flagged, early heading, very productive.

(c) High silicon line (1.28%) - leaves narrower, stiff pointed, not flagged, 7-10 days later than (b) in heading and ripening of seed.

Released: No, seed not available at present for testing purposes.

Festuca idahoensis Elmer, Idaho fescue.

P-6135

Selected at the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington -- R. J. Olson and J. L. Schwendiman.

Source: Collected from the native Ponderosa pine - grassland association near Winchester, Idaho by Donald Hedrick in 1938.

Method of breeding: The accession was outstanding among 61 collections. It was improved by mass selection during several generations.

Description: A vigorous, long-lived perennial, bunch-type fescue. It has excellent seedling vigor and a strong root system. Leaves are dark green, basal, and abundant. Seed culms are spreading, abundant, and to 36" in height. Seeds are large and awned. Seed production is much better than any strain previously found.

Released: No, included in variety tests.

Breeder seed: Plant Materials Center, SCS, U.S.D.A., Pullman, Washington.

Certified seed: Not available.

Festuca ovina L., sheep fescue.

P-274

Selected at the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington -- J. L. Schwendiman.

Source: PI 109, 947 south of Konya, Turkey introduced by the Westover-Enlow Expedition, 1934.

Method of breeding: Selections from spaced plantings in which aberrant types were eliminated.

Description: A dwarf, blue-green, densely tufted erect growing strain with abundant fine stems and dense, short, stiff, harsh, abundant basal leaves. Adapted to dry sites in 8-14 inch rainfall areas and at high altitudes.

Released: No.

Breeder seed: Plant Materials Center, SCS, U.S.D.A., Pullman, Washington.

Certified seed: Not available.

Festuca ovina var. duriuscula (L.) Koch, hard fescue.

P-2517

Selected at the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington -- V. B. Hawk and J. L. Schwendiman.

Source: Collected from an old planting on the Eastern Oregon Livestock Experiment Station at Union, Oregon in 1934 by V. B. Hawk.

Method of breeding: Mass selection for several generations.

Description: Hard fescue is a tall growing, semi-erect, densely tufted perennial bunchgrass. It differs from sheep fescue in its smoother, wider, longer and firmer leaf blades. It is a large form of sheep fescue and is closely related to chewing fescue but is more drought resistant and more densely tufted. It is a heavy root producer and is shade tolerant. Its foliage is basal and harsh. Its seed production is consistently high. Its primary use is for soil protection on roadsides, ditchbanks and as a soil improvement understory grass in orchards. In mixtures with alfalfa for hay, it is a very heavy root producer. It is widely adapted to rainfall areas of 14-30 inches and well drained irrigated soil.

Released: 1949, cooperatively by the Washington, Idaho, and Oregon Agricultural Experiment Stations, and the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington.

Breeder seed: Plant Materials Center, SCS, U.S.D.A., Pullman, Washington.

Certified seed: Available.

Illahnee

Selected at the Oregon Agricultural Experiment Station, Corvallis, Oregon;
Agricultural Research Service, USDA, cooperating - H. A. Schoth.

Source: Seed lot imported in 1937 from England by Oscar Loe, Silverton,
Oregon.

Method of breeding: Comparative tests at Corvallis, Oregon, and Beltsville,
Maryland.

Description: A turf variety that has fine stems and leaves and a slow rate
of spread. It produces a dense, uniform, fine textured turf. At Beltsville,
Illahnee established more rapidly from fall seeding and was more cold tolerant
than five varieties of red fescue, including, Oregon grown commercial with
which it was compared.

Released: 1950, cooperatively by Oregon Agricultural Experiment Station and
Crops Research Division, Agricultural Research Service.

Breeder seed: Oregon Agricultural Experiment Station and Crops Research
Division, Agricultural Research Service.

Certified seed: Available in quantity.

Olds

Selected at the School of Agriculture, Olds, Alberta, Canada.

Description: Growth habit is erect to spreading, perennial with short rootstalks.
Few fertile shoots 35 to 60 cm. tall, relatively numerous long-leaved sterile shoots.
Hardy to temperatures common throughout western Canada. Moderately drought tolerant,
not subject to disease in Alberta. Recommended for use in lawns, fairways, pastures
and for soil conservation.

Released: Yes, School of Agriculture, Olds, Alberta.

Certified seed: Available (certified in Canada and Pacific Northwest).

Pennlawn

Selected at the Pennsylvania Agricultural Experiment Station, University Park,
Pennsylvania -- H. B. Musser.

Source: Individual plants selected from the University Golf Course fairways.
This turf was seeded approximatlly 30 years previously with seed of European
origin.

Method of breeding: Screening tests of source material received from England,
Hungary, Canada and the United States. Sod plugs were collected from established
turf and included in tests. Turf quality tests of approximately 50 strains
established at University Park, Pennsylvania, and Beltsville, Maryland. Three
superior strains (on basis of data from two locations) were isolated for increase.
Strains identified as F-55(38), F-74(38) and F-78(38).

Description: The synthetic variety, Pennlawn, produces better turf than any of
the original parents. It is not immune to leafspot diseases but is decidedly
tolerant to them -- it is not attacked severely and recovers rapidly; it is
characterized by good foliage density, rapid spread and ability to withstand close
clipping.

Released: 1954, by Pennsylvania Agricultural Experiment Station.

Breeder seed: Pennsylvania Agricultural Experiment Station.

Certified seed: Available.

Rainier

Selected at the Oregon Agricultural Experiment Station, Corvallis, Oregon; ARS, U.S.D.A., cooperating -- H. A. Schoth.

Source: Accession received in 1938.

Description: High seed yielder, stiff stems, good turf developer, long-lived, dark green uniform color, rapid grower and resistant to common leaf, stem and head diseases in Pacific Northwest.

Released: 1944, cooperatively by Oregon Agricultural Experiment Station and Crops Research Division, ARS.

Breeder seed: Oregon Agricultural Experiment Station.

Certified seed: Available.

Lolium multiflorum Lam., Italian ryegrass. Also Lolium multiflorum x L. perenne and L. multiflorum x L. rigidum.

Florida Rust Resistant

Selected at the North Florida Branch Experiment Station, Quincy, Florida -- T. E. Webb.

Source: Selections from domestic ryegrass and introductions.

Method of breeding: Mass selection.

Description: Rapidly developing, rust resistant variety. It appears to be in the same early maturity class as La Estanzuela, and equals or surpasses this variety in rust resistance.

Released: No, included in regional grass tests.

Breeder seed: North Florida Experiment Station.

H-1

Selected at the Plant Research Bureau, Grasslands Division, Palmerston North, New Zealand.

Source: Selection from artificial hybrid between Lolium multiflorum x L. perenne.

Description: Combines the high productive capacity and palatability of Italian ryegrass with some of the permanence of perennial ryegrass. It is a "short-rotation" ryegrass that exhibits an ability for winter production under New Zealand conditions superior to that of either of its parents. It requires good soil fertility.

Released: In New Zealand. Has been included in regional grass tests.

Certified seed: Not generally available in the United States.

Selected at the La Estanzuela Experiment Station, Colonia, Uruguay.

Description: An annual variety that exhibits an appreciable amount of rust resistance. It is relatively early, and is more susceptible to cold injury than domestic ryegrass.

Released: In commercial production in Uruguay. Several accessions have played an important role in ryegrass breeding programs in the United States. These include:

T.O. 1,882 - Obtained by R. M. Love, California Agricultural Experiment Station, Davis, California.

P.I. 193,145 - Obtained by O. S. Aamodt, Beltsville, Maryland.

P.I. 201,980

Accession P.I. 193,145 has looked very promising in tests conducted at the Rice-Pasture Experiment Station, Beaumont, Texas by R. M. Weihing. P.I. 193,145 has been increased for further testing.

Certified seed: Not available.

Ryegrass 12

Selected at the Plant Research Bureau, Grasslands Division, Palmerston North, New Zealand. Increased at the California Agricultural Experiment Station in 1943.

Source: Selections from artificial hybrid between Lolium multiflorum x L. perenne.

Description: Morphologically it is intermediate between the parents. It is variable, starts growth early and has been described as remaining green longer than annual ryegrass.

Released: In New Zealand. Has been included in regional grass tests.

Certified seed: Not generally available in the United States.

Stoneville No. 1

Selected at the Delta Branch Experiment Station, Stoneville, Mississippi; Agricultural Research Service, U.S.D.A., cooperating -- H. W. Johnson, H. W. Bennett and C. L. Blount.

Source: P.I. 194,395 introduced from Uruguay.

Method of breeding: Open pollinated seed collected from five superior plants. Progenies were grown in the greenhouse and inoculated with crown rust in the seedling stage. The plants remaining rust-free were transplanted to a space-planted field nursery.

Description: The five open-pollinated selections were progeny tested in a row nursery at McNeill, Mississippi in 1953-54. All were scored 1 for rust, while the rows of domestic ryegrass in this nursery were all scored 5. The five lines were seeded in an isolated polycross nursery at Stoneville in the fall of 1954. In an artificial inoculation test conducted in the greenhouse during the 1954-55 season, these five lines were found to contain the following percentages of rust resistant plants: 95, 100, 79, 88, and 83. Open pollinated seed was harvested from the polycross in the spring of 1955. At Stoneville this strain appears to be as productive as domestic ryegrass and La Estanzuela 284 and is considerably more rust resistant than either.

Released: No, increased for testing.

Breeder seed: Maintained at the Delta Branch Experiment Station, Stoneville, Mississippi.

Tifton #1 rust resistant

Selected at the Georgia Coastal Plain Experiment Station, Tifton, Georgia; ARS, U.S.D.A., cooperating -- Homer Wells.

Source: Westerwold's ryegrass.

Method of breeding: Five plants that appeared to be immune to rust were selected from artificial inoculation tests. Progenies have been screened for rust in artificial tests, and selections made to repeat the cycle. Field selection is being practiced for resistance to leaf spot diseases.

Released: No, included in regional grass tests.

Breeder seed: Georgia Coastal Plain Experiment Station.

Wimmera

Selected by the Western Australian Department of Agriculture.

Source: Naturalized in the Wimmera-Mallee areas of Victoria. Possibly a hybrid between *L. rigidum* and *L. multiflorum*. Seed obtained from F. H. Brunning, Ltd., Melbourne, Australia; increased at the Plant Materials Center, Pleasanton, California, and the former San Fernando Nursery, San Fernando, California, as P-11h19.-- D. J. Vanderwal and Paul Lemmon.

Description: Variable in type ranging from *L. rigidum* to *L. multiflorum*. Dominant type assumes an upright growth with rigid geniculate stems but plants with a sprawling growth and branched stems and seedheads also occur. Capable of good growth under adverse conditions and will complete its life cycle in very short growing seasons.

Released: Department of Agriculture, Victoria, Australia. Not released in the United States. Used in Soil Conservation Districts in southern California in short-rotation dryland seedings and for quick, but short-lived, cover on burns.

Breeder seed: Plant Materials Center, SCS, U.S.D.A., Pleasanton, California.

Certified seed: Not available (in commercial production).

Lolium perenne L., perennial ryegrass.

P-312

Increased at Soil Conservation Service Nursery, Pullman, Washington.

Source: Received at S.C.S. Nursery, Pullman, Washington in 1935 as PI 107,071 *Lolium rigidum*. Reidentified in 1938 as *L. remotum*, subsequently classed as *L. perenne*.

Description: Consistently more winter hardy, more productive and longer lived than other strains of perennial ryegrass at Pullman, Washington. Uniform and free from annual and short-lived plants. Material may be different from original introduction by virtue of natural selection.

Released: No, included in regional testing program.

Breeder seed: Soil Conservation Service in cooperation with Washington State Agricultural Experiment Station.

Certified seed: not available.

S-23

Selected at the Welsh Plant Breeding Station, Aberystwyth, Great Britain.

Source: Material obtained from old grazed pastures (Midlands, Kent, Lincolnshire, Wales and Holland).

Description: Spreading growth, late flowering habit; high tillering, dense, leafy. Very persistent under grazing.

Released: Welsh Plant Breeding Station. Included in some regional grass tests in the United States.

Certified seed: Available from Great Britain.

S-24

Selected at the Welsh Plant Breeding Station, Aberystwyth, Great Britain.

Source: Based primarily on two wild plants, but not from an old grazed pasture. These two plants have been interbred and further "native" basic plant material has been added. Also some plants from the produce of Hawkes' Bay (N.Z.) seed have been selected and incorporated in the strain.

Description: In Great Britain it is more persistent and leafier than most ordinary strains, and is capable of producing heavy crops and good aftermath. S-24 starts growth earlier than most ordinary strains.

Released: Welsh Plant Breeding Station. Included in some regional grass tests in the United States.

Certified seed: Available from Great Britain.

S-101

Selected at the Welsh Plant Breeding Station, Aberystwyth, Great Britain.

Source: Based entirely on plants derived from very old pastures of the Midlands and Kent.

Description: Flowers only slightly earlier than S-23, and plants are less spreading, leaf blades longer and often broader. A leafy dual purpose strain approaching hay type.

Released: Welsh Plant Breeding Station. Included in some regional grass tests in the United States.

Certified seed: Available from Great Britain.

Oryzopsis hymenoides (Roem. & Schult.) Ricker, Indian ricegrass.

P-2575

Selected at the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington -- J. L. Schwendiman.

Source: Native collection made in 1935, 5 miles south of Whitebird, Idaho.

Method of breeding: Selected from among 152 accessions for its good vegetative characteristics and low hard seed content. Selection was repeated through several generations before initial increase.

Description: Large, erect, plant-type, robust stems, and broad, flat, abundant leaves. Has medium small, dark, almost naked, elongate seeds. Shows excellent seedling vigor and has an average of less than 50 percent hard seeds.

Released: No, in testing programs.

Breeder seed: Plant Materials Centers, SCS, USDA, Pullman, Washington and Aberdeen, Idaho.

Certified seed: Not available.

Panicum antidotale Retz., blue panicgrass.

Algerian

Increased at the Oklahoma Agricultural Experiment Station, Stillwater, Oklahoma; ARS, U.S.D.A., cooperating -- J. R. Harlan.

Source: A seed lot received in 1953 from Algeria under the number St 453. This lot bears the accession number 3997.

Description: Has been increased in the hope that it might be more winter hardy than common material. It begins growth some 10 days to two weeks earlier in the spring, than other sources, but by mid-summer is indistinguishable from other varieties.

Released: No, distributed for testing purposes.

Breeder seed: Oklahoma Agricultural Experiment Station.

T-15,327

Selected by personnel of the former Woodward, Oklahoma SCS Nursery, OK-N-2. -- James E. Smith, Jr. and Gordon L. Powers.

Source: Bulk common strain of blue panic, derived from commercial increase of Tucson, Arizona SCS Nursery Acc. A-130. Increased for testing as T-15,327.

Method of breeding: One-year old seedlings that survived -18 degrees F. in a dryland field planting were increased clonally, extremes in height, plant texture, end dates of flowering were discarded, and the remaining plants bulked. Parent plants of these seedlings survived -11 degrees F. in two successive years prior to the field planting using seed harvested from them.

Description: This strain is relatively uniform in makeup, is leafy, has medium fine stems, is a heavy seed producer, and is considered to be more cold tolerant than common strain available in the market.

Released: Informally by SCS in 1949.

Breeder seed: None.

Certified seed: None (in commercial production).

Panicum coloratum L.

Kleingrass 75

Selected at former San Antonio SCS Nursery TX-N-1. James E. Smith, Jr. Name taken from page 66 of "Common Names of Grasses in South Africa"--"Klein(buffels) gras"--Panicum coloratum. Last two digits of the accession number added to distinguish the strain from others of similar origin.

Source: Introduced from Kimberley, South Africa as PI 166,400, BN 5225. Increased for testing as T-20,275.

Description: The strain is very productive, leafy, fine stems, plants mostly erect, good seed producer, and is drought tolerant. A warm season perennial; tends to remain evergreen at San Antonio where it produces fresh green growth at all times during the winter except when temperatures fall below 25 degrees F. Trailing stems root at nodes to form fairly dense sod when in contact with moist soil. This accession is the best that has been under observation at San Antonio. Plant makeup is quite variable and improvement selection for greater uniformity should be possible. Well adapted to heavy soils, though complete soil and climatic adaptation not yet fully known. Probably not suited to areas where winter temperatures normally fall below zero F.

Released: Informally by SCS. Small amounts of seed were sent to selected soil conservation district cooperators in 1954 for trial.

Breeder seed: Maintained at Plant Materials Center, San Antonio, Texas.

Certified seed: None.

Kleingrass Syn. #1

Selected former San Antonio SCS Nursery, TX-N-1. -- James E. Smith, Jr.

Source: South Africa.

Method of breeding: Equal amounts of selfed seed from a single outstanding plant and open-pollinated seed from another accession similar in plant characters mixed to form the synthetic strain. Single plant selected from T-4453, PI-142,284, BN-2731. Open-pollinated accession - Albuquerque SCS Nursery A-14,156, PI-190,327, BN-6876.

Description: Plants are tall, very leafy, leaves carried high along stems, more erect than most accessions of the species seen at San Antonio, heavy head production. The single plant was an exceptionally good seed producer when open-pollinated. Clonal increase of this plant revealed it to be largely self-sterile. Stands from open-pollinated seed of the single plant resulted in a population predominantly similar to the single plant.

Released: No, included in observational trials.

Breeder seed: Plant Materials Center, San Antonio, Texas.

Certified seed: None.

Panicum virgatum L., switchgrass.

Blackwell

Selected at the SCS Nursery, Manhattan, Kansas -- Donald R. Cornelius.

Source: Seed harvested in 1934 from a single plant growing in native prairie near Blackwell, Oklahoma.

Method of breeding: Single plant selected in comparison with many other collections at the Manhattan Nursery. Tested as KG-208.

Description: Ranked high in leafiness, total forage produced, and in resistance to rust and other diseases. It ranked well in seed production and in seedling vigor. This is an upland type switchgrass of medium height growth and rather large stems. Consistently produces 400 pounds of seed per acre under irrigation.

Released: Named and officially released in 1944 in cooperation with Kansas Experiment Station, Manhattan, Kansas. Is extensively used in waterway and other permanent grass plantings in Kansas, Oklahoma, and Texas.

Breeder seed: A 10-acre foundation seed field established in 1946 is maintained at the Plant Materials Center, Manhattan, Kansas.

Certified seed: Available in quantity Kansas growers.

Caddo

Selected at the Oklahoma Agricultural Experiment Station, Stillwater, Oklahoma; Agricultural Research Service, U.S.D.A., cooperating -- H. W. Staren, W. C. Ricker, R. A. Chessmore, and J. R. Harlan.

Source: Field collections from the Southern Great Plains with emphasis on central Oklahoma.

Method of breeding: Mass selection in space-planted nurseries, with elimination of undesirable types. Process repeated using most promising lines, and seed from selected plants used to establish rows. Five rows selected for uniformity and superior production, and seed bulked to form experimental strain 4200.

Description: A tall, robust upland switchgrass generally characteristic of central Oklahoma. It is leafy and productive, has considerable rust resistance, is rather uniform when seeded in rows for seed production, and gives a heavy yield of seed under favorable conditions. The forage yield under irrigation is outstanding for a native grass, and it recovers well after mowing. There are no special features which distinguish it positively from other varieties, but it tends to be greener and contains less red pigment in stems and heads than many other varieties.

Released: 1955, cooperatively by the Oklahoma Agricultural Experiment Station and the Crops Research Division, ARS.

Breeder seed: Oklahoma Agricultural Experiment Station.

Certified seed: Available.

Nebraska 28

Developed at the Nebraska Agricultural Experiment Station, Lincoln, Nebraska; ARS and SCS, U.S.D.A., cooperating -- L. C. Newell.

Source: A native stand of switchgrass, Holt county, Nebraska. The original collection was made by L. C. Newell in 1935.

Method of selection: Spaced plants grown at the Experiment Station from the original collection were selected for type and allowed to cross-pollinate in isolation. The resulting seed was bulked and increased.

Description: A relatively early maturing strain of switchgrass, representative of the Nebraska Sandhill types. Average plants are semidecumbent, with fine stems of moderate height, bluish-green and leafy; but considerable variation of plant type exists. This variety is well adapted to a diversity of soils and is used successfully for pastureage and for soil conservation purposes such as seeded waterways in pure stands or mixtures. It matures seed in mid-August to early September. In areas with longer growing seasons, the variety is susceptible to rust, which is likely to be a serious factor in production.

Released: 1949, by the Nebraska Agricultural Experiment Station in cooperation with the ARS and the SCS, U.S.D.A.

Foundation seed: Foundation Seed Division, Department of Agronomy, Nebraska Agricultural Experiment Station, Lincoln, Nebraska.

Certified seed: Available in quantity.

Woodward strains

Selected at the U. S. Southern Great Plains Field Station, Woodward Oklahoma, in cooperation with the Oklahoma Agricultural Experiment Station -- J. R. Harlan.

Source: Local populations plus some collections from Texas and New Mexico.

Description:

W1: A short, leafy blue type, good seeding habits. Only 80% fixed for short type. This strain has been discarded.

W2: A short, leafy type, finer than W1. Contains both green and blue types. Apparently somewhat better forage quality than W1; seed production about the same.

Released: No, seed of W2 increased for testing only. In all probability will not be given further consideration in Oklahoma following the release of Caddo.

Breeder seed: U. S. Southern Great Plains Field Station.

Paspalum dilatatum Poir., dallisgrass.

Prostrate

Selected at the Georgia Coastal Plain Experiment Station, Tifton, Georgia; Agricultural Research Service, U.S.D.A., cooperating -- Glenn W. Burton.

Source: This material came from material obtained from Dr. Ben Smith, North Carolina State College, Raleigh, North Carolina, who received it from Dr. Bernardo Rosengurt of Montevideo, Uruguay.

Method of breeding: Seeds from a number of progenies that appeared to be similar in type and 100% apomictic were blended and increased to furnish the seed released in regional tests.

Description: This material is more prostrate, more resistant to the foliage diseases, and more persistent, maintaining good stands much longer than common dallisgrass. It has also outyielded common dallisgrass in clipping tests at Tifton, Georgia. It is very susceptible to ergot, very irregular in meiosis, and poor in seed production.

Released: No, included in regional tests in 1950.

Breeder seed: Georgia Coastal Plain Experiment Station, Tifton, Georgia.

Strain B230

Selected at the Louisiana Agricultural Experiment Station, Baton Rouge, Louisiana -- C. R. Owen.

Source: Lot B of seven lots of seed collected from natural stands in lower Red River bottom. Selection made in 1941.

Method of breeding: Plant selection followed by progeny testing for seed quality and forage vigor evaluation. Tested in new strains evaluation experiments where seed yields, seed quality and forage were compared.

Description: Not distinguishable from common dallisgrass. Produces better quality seed than common dallisgrass by about 30%. Remains green later in the fall than common dallisgrass and begins growth earlier in the spring.

Released: 1951, in cooperation with Louisiana Crop Improvement Association.

Breeder seed: Louisiana Agricultural Experiment Station, Baton Rouge, Louisiana.

Certified seed: Not available.

Strain 430

Selected at the Louisiana Agricultural Experiment Station, Baton Rouge, Louisiana -- C. R. Owen.

Source: The nursery from which the selection was taken was planted from seed collected in the same area. Selection made in 1943 in space planted nursery at Hamburg, Louisiana.

Method of breeding: Plant selection normal forage type which excelled in viable seed produced. Tested in progeny row and extended to new strains test where both seed and forage production were compared.

Description: Has no definite distinguishing characteristics for identification. This strain exceeded the average of the strains included by 32% for pure seed content. Ergot infected florets amounted to 28% less than the average.

Released: During 1951 season in cooperation with Louisiana Crop Improvement Association.

Breeder seed: Louisiana Agricultural Experiment Station, Baton Rouge, Louisiana.

Certified seed: Not available in quantity.

Paspalum nicorae Parodi

Brunswickgrass

Source: Sprigs dug March 1, 1945 at Brunswick, Georgia and transplanted at SCS Nursery, Americus, Georgia by Paul Tabor. Grown under experimental number SC 20-672.

Description: A rhizomatous species generally similar to bahiagrass. More than two seed racemes per stem. Some plants glaucous, others light green. Dense sod produced.

Released: No.

Breeder seed: None.

Certified seed: None.

Seed for trial can be secured from Americus Nursery, John D. Powell, Supt., Americus, Georgia

Paspalum notatum Flügge, bahiagrass

Argentine

Selected at the Florida Agricultural Experiment Station, Gainesville, Florida; Agricultural Research Service, U.S.D.A., cooperating -- George Ritchey.

Source: P.I. 148,996 from Argentina.

Method of breeding: Selected as one of two distinct types from this introduction in 1945. Plots and pastures planted in 1945-46.

Description: Wider leaves than Pensacola, but narrower than common. Preferred by cattle. Medium cold resistance, making most growth during mid-summer months. Very susceptible to ergot. Adapted throughout Florida and coastal areas of other southern states.

Released: 1949-50, cooperatively by the Florida Agricultural Experiment Station and the Crops Research Division, Agricultural Research Service.

Seed: Commercial seed available in quantity.

Certified seed: Not available.

Paraguay

Source: Origin obscure. Presumably traces to early introductions that became established along the Gulf of Mexico.

Description: A coarse, tough variety. Leaves shorter and hairier than those of Pensacola. Used to some extent as a general purpose turf grass.

Released: No.

Breeder seed: Not available.

Certified seed: None. (Some commercial production in Texas).

Pensacola

Source: Found by former County Agent, Ed Finlayson, Pensacola, Florida. Sprigs from vacant lot on Government Street, Pensacola, Florida, were taken to the SCS Nursery, Americus, Georgia, in May, 1940 by Paul Tabor.

Source: Plants growing along docks and railroad tracks at Pensacola. Thought to have arrived by fruit boat from Central or South America.

Method of breeding: Comparative tests conducted at several Experimental Stations. Plots for forage yield and chemical composition, and experimental pastures were planted at Gainesville, Florida, in 1942.

Description: Similar to common bahiagrass except it is more cold hardy, narrower blades, smaller seed and is more responsive to fertilization. Seed germination is excellent with full stands and ground cover in 8-12 weeks. Adapted throughout southeastern Coastal Plains area and to all of Florida.

Released: Approved as a superior forage by Florida Agricultural Experiment Station in 1944. Seed distributed by Americus Nursery in 1942, with first large scale distribution in 1944.

Breeder seed: Americus Nursery (Plant Materials Center), Americus, Georgia.

Certified Seed: Available.

Pensacola x common

Source: Selected at the Georgia Coastal Plain Experiment Station, Tifton, Georgia; Agricultural Research Service, U.S.D.A., cooperating -- Glenn W. Burton.

Description: This is an F₁ hybrid between selected plants from Pensacola bahiagrass and common broadleafed bahiagrass.

Method of breeding: This is a triploid from the cross, Pensacola (diploid) x common (tetraploid). It is sterile in isolation but seeds well when interplanted with a pollinator such as Pensacola bahiagrass. The seeds produced give rise to a uniform progeny exactly like the female parent indicating reproduction by apomixis.

Description: This hybrid has broader, more tender leaves than Pensacola bahia-grass and is more palatable. It has outyielded the common parent two-fold and the Pensacola parent by 10 to 15% in replicated clipping trials.

Released: No, included in regional tests in 1950.

Breeder seed: Georgia Coastal Plain Experiment Station, Tifton, Georgia.

Certified seed: None available.

Tifhi 1

Selected at the Georgia Coastal Plain Experiment Station, Tifton, Georgia; Agricultural Research Service, U.S.D.A., cooperating -- Glenn W. Burton.

Source: Developed from selected clones coming from commercial Pensacola bahia-grass.

Method of breeding: Selected clones of Pensacola were tested for general combining ability in polycross tests. The best of these were tested for specific combining ability in singlecrosses. Two of the best of these that were self-sterile and cross-fertile and gave a good singlecross carry the test numbers 14 and 108. These are interplanted vegetatively in strips up to 30 feet wide to establish seed production fields where hybrid seed may be produced simply by combining all seed produced. Distributed for testing as Pensacola hybrid 14 x 108.

Description: Tifhi 1 is slightly leafier than commercial Pensacola and one of the parents (No. 108) is more shatter-resistant, facilitating seed production. The hybrid carries considerable heterosis, yielding up to 25% more forage than the commercial check. In a four-year grazing trial in replicated pastures, it produced 69 pounds more beef per acre per year than the commercial Pensacola -- a statistically significant difference.

Released: 1957, cooperatively by the Georgia Coastal Plain Experiment Station and the Crops Research Division, Agricultural Research Service.

Breeder stock: Georgia Coastal Plain Experiment Station, Tifton, Georgia.

Certified seed: Available in limited quantities in 1958.

Tifton

Increased at the Georgia Coastal Plain Experiment Station, Tifton, Georgia; Agricultural Research Service, U.S.D.A., cooperating -- J. L. Stephens.

Source: P.I. 158,822 introduced from Paraguay in 1947.

Method of breeding: Selection of one plant in source nursery. Progeny tests indicated that the selection was true breeding and in all probability 100% apomictic.

Released: No.

Breeder seed: Georgia Coastal Plain Experiment Station, Tifton, Georgia.

Certified seed: Not available (some seed has been produced under the name Paraguay 22).

Wilmington

Collected at Wilmington, North Carolina 6-12-40 by Paul Tabor.

Source: Naturalized stand. Material tested under experimental number SC 20-338.

Description: A narrow leaf, cold hardy bahia making a dense sod, plants of medium size. This is the only bahiagrass not injured by cold at Chapel Hill, North Carolina between 1941 and 1953.

Released: No formal release. Seed distributed from SCS Nursery, Rock Hill, South Carolina, 1943.

Breeder seed: None.

Certified seed: None.

Commercial seed: None.

A small supply of seed is available in Georgia and the Carolinas

Pennisetum ciliare (L.) Link, buffelgrass.

Blue buffel

Selected former San Antonio SCS Nursery TX-N-1. -- James E. Smith, Jr.

Source: Pretoria, South Africa. PEI-133, 898. Received March, 1940, increased for testing as T-3782.

Description: This strain was selected over other similar accessions because of its early spring growth recovery (about 3 weeks ahead of T-4464 buffel), vigorous summer growth and high forage production, rapid spread by means of short rhizomes, drought tolerance, resistance to injury by leaf hoppers and aphids, and tolerance to light frost (active growth continues in the fall about 3 weeks longer than T-4464 buffel). Blue buffel is best adapted to clay soils from Sonora eastward and Waco southward. It is a relatively low seed producer, and is limited in use within its area of adaptation by a chronic shortage of commercial seed supplies. Both green and cured forage readily eaten by cattle. Plants are perennial.

Released: Informally by SCS in 1952.

Breeder seed: Not applicable.

Certified seed: None (in commercial production).

PL-155084

Increased at SCS Nursery, Brooksville, Florida.

Source: Seed collected in Pretoria, South Africa by Mr. Van Rensburg. Reported by him as being one of the very good grasses of the Union of South Africa. Received at Brooksville, Florida in 1947.

Description: The foliage is light bluish in color. It makes only a few seedheads as compared with the Pennisetum ciliare sold commercially. The seed are viable. It tillers as well as spread by rather stout, sharp pointed, round, smooth rhizomes. The culms grow to be about four feet tall under moderate fertilization. The leaves are long and stiffer than those of the commercial buffelgrass. The stems become woody upon maturity. Foliage is palatable and nutritious. The grass has an odor of molasses similar to that which is emitted by Molasses grass, Melinis minutiflora.

Released: No, increased for testing.

Breeder seed: Seed for testing available from SCS.

Certified seed: None

T-4464

Selected former San Antonio SCS Nursery TX-N-1 -- D. H. Foster. Called "Buffelgrass" in the belief that common name had significant reference to the species in South Africa. It was later learned that buffelgrass is a name applied indiscriminately to many other species and genera in that country.

Source: Pretoria, South Africa. PI-153,671, BN-4112. Received April, 1946.
Increased for testing as T 4464.

Description: A leafy perennial bunchgrass especially well-adapted to deep sandy soils in the portion of Texas where winter temperatures seldom fall as low as zero F. It is a heavy seed producer, with yields of 300 to 600 pounds per acre not uncommon under irrigation. Plants are characteristically light green in color with good seedling vigor, good drought tolerance, and the ability to grow rapidly from early spring through the hot summer months. Stems may reach 48 inches in height at seed maturity.

Released: Informally by SCS in 1949.

Breeder seed: Not applicable.

Certified seed: None. (In commercial production)

Pennisetum glaucum (L.) R. Br., pearl millet.

Georgia Hybrid No. 1 (Gahi-1)

Selected at the Georgia Coastal Plain Experiment Station, Tifton, Georgia; Agricultural Research Service, U.S.D.A., cooperating -- Glenn W. Burton.

Source: The commercial F₁ hybrid is developed from four inbred lines selected from many isolated from common cattail millet, a number of introductions from Africa and India, and hybrids between them.

Method of breeding: Inbred lines have been isolated, stabilized, and tested for general and specific combining ability. Four of these carrying the numbers 13, 18, 23, and 26, chosen because they give good high-yielding singlecrosses in all combinations, are used to produce the hybrid seed. The F₁ seed is produced by harvesting all open-pollinated seed from an isolated field planted to a mixture of equal numbers of live seeds of inbreds 13, 18, 23, and 26. This seed containing 65 to 75% of hybrids and 25 to 35% of selfs or sibs will perform as well as 100% hybrid seed when planted at a rate of 10 pounds per acre in 30- to 36-inch rows.

Description: Georgia Hybrid No. 1 is leafier, later-maturing, and more productive than common cattail millet. At Tifton, it has yielded 50% more forage for the period May through September and over three times more after August 1 than the common check. Recovery after grazing is also much faster.

Released: Plans have been made to name and release this experimental variety in 1958. Included in regional tests in 1955. Proposed name - Gahi-1.

Breeder seed: Georgia Coastal Plain Experiment Station, Tifton, Georgia.

Certified seed: Not available until released for general farm use, probably 1958.

Hybrid Pearl Millet SJ

Developed by the J. R. McNeill Seed Company, Spur, Texas -- J. R. McNeill and associates.

Source: A single plant, diminutive, very sweet and juicy. At the time this plant was found, we were unable to find any reference to sweetness in P. glaucum in the literature. This plant occurred in material supplied by the Lubbock Station, Texas Agricultural Experiment Station, and was from Bureau of Plant Introduction material, probably from India.

Method of breeding: This plant progeny was crossed with numerous lines of common pearl millet, showing the maturity range, leafiness, yield potential, disease resistance and drought tolerance resulting in work in progress from which Pearl Millet No. 7 was developed. The No. 7 line was not used because of dominance for dry non-sweet character. 80 promising selections were planted at Summerfield, Texas, under the supervision of George C. Warner in 1954, and 20 were further tested at Spur in 1955. That planting afforded an opportunity for observation of chinch bug susceptibility and three lines were dropped. Further selections for freedom from leaf diseases were made. The present 7 inbred lines are the result of continuing selection, with production of two generations per year.

Description: Hybrid Pearl Millet SJ is mildly sweet in the grazing and ensiling stage and is juicy. Seed is larger than common, not so large as No. 7, and seedling vigor is good. Heads are smaller than No. 7, stalks not quite so tall, leafy and free tillering.

Released: Hybrid Pearl Millet SJ was made available to various research organizations in 1955. About 50,000 pounds of seed was distributed commercially in 1957 from California to Florida and as far north as Iowa.

Seed available: Production in 1957 should be 200,000 pounds.

Certified seed: Not available.

Pearl Millet No. 7

Developed by the J. R. McNeill Seed Company, Spur, Texas -- J. R. McNeill and associates.

Source: Production field of common pearl millet, plant selection made by Elmer Edwards, 1948.

Method of breeding: Selected plants were selfed in the nursery. Next generations were duplicated on dryland and land under supplemental irrigation.

Description: Pearl Millet No. 7 (originally sold as Cattail Millet No. 7 and often listed as Texas No. 7) is tall, mid-leafy, mid-early, having large compact heads. Seed is larger than average lots of common observed, and germination and seedling vigor are good. Well developed heads have an angled tip, a character seen frequently in the species.

Released: No formal release was made of this variety. Seed was submitted to Beltsville for uniform variety tests and the variety has been produced and widely distributed since. Texas has had no certification program on the *P. glaucum* varieties until this year (Starr) and no attempt was made to get a homozygous line because of the high incidence of crossing and the importance of hybrid vigor in open pollinated *P. glaucum*.

Seed available: In quantity.

Certified seed: Not available.

Starr

Selected at the Georgia Coastal Plain Experiment Station, Tifton, Georgia; Agricultural Research Service, U.S.D.A., cooperating -- Glenn W. Burton.

Source: Developed as a synthetic from material that traces its origin to common cattail millet and introductions carrying the P.I. numbers 115,055 and 115,059.

Method of breeding: A broad-leaved, highly palatable inbred line of common cattail millet was crossed with a broad-leaved, short internode, leafy dwarf in 1944. Selected F₂ plants carrying the desired combination of characters were tested and reselected in advanced selfed generations. Finally, the best were re-combined in the synthetic that bears the name "Starr" in honor of the first Director of the Georgia Coastal Plain Experiment Station, Tifton, Georgia, Silas Starr.

Description: Starr millet has broader leaves, shorter internodes and stems and more leaves per stem than common cattail millet and matures 4 to 6 weeks later. In clipping trials, it has produced about as much total dry matter as common millet, but has produced much higher yields of leaves. It is easier to manage under grazing, lasts longer, and has produced more beef and milk under grazing than the common type.

Released: 1951, cooperatively by the Georgia Coastal Plain Experiment Station and the Crops Research Division, Agricultural Research Service.

Breeder seed: Georgia Coastal Plain Experiment Station, Tifton, Georgia.

Certified seed: Available in quantity.

Pennisetum purpureum Schumach., napiergrass.

Merkeron

Selected at the Georgia Coastal Plain Experiment Station, Tifton, Georgia, ARS, U.S.D.A., cooperating - Glenn W. Burton.

Source: An F₁ hybrid between two selections carrying the numbers 1 and 208.

Method of breeding: From 1936 to 1941, selection within open-pollinated seedling progenies of local types and introductions was practiced. In the fall of 1941, a number of these selections were hybridized to combine desirable characteristics, including resistance to Helminthosporium eyespot. One of these crosses involving selection No. 1, a vigorous common type, and No. 208, a plant with very short internodes and many tillers, gave plants yielding 35% more than the checks and best common Napier grass hybrids. In 1944, several of the best of these hybrids were sent to Rio Piedras, Puerto Rico, for testing. The best of these, a cross between No. 1 and No. 208, was released under the name "Merkeron" in 1955 by Dr. Velez Fortuno, Head of Plant Breeding at the Experiment Station at Rio Piedras.

Description: Merkeron is a leafy, many-tillered, late maturing F₁ hybrid resistant to the Helminthosporium eyespot disease.

Released: 1955, by the Experiment Station at Rio Piedras, Puerto Rico.

Breeder stock: Experiment Station, Rio Piedras, Puerto Rico.

Certified seed: Not available.

Phalaris arundinacea L., reed canarygrass.

Ioreed

Developed at the Iowa Agricultural Experiment Station in cooperation with the SCS Nursery, Ames, Iowa -- H. D. Hughes, and C. P. Wilsie.

Source: Parental clones selected from an old Iowa strain and four Minnesota strains, Oregon commercial, two U.S.D.A. strains, and two German introductions introduced into Iowa during 1920's and early 1930's.

Method of breeding: Ten clones from above sources selected on the basis of forage and seed yielding ability and forage quality were saved and recombined. The Iowa clone represented about one third and the other 9 sources about 7 percent each of the seed recombined to form Ioreed. Syn. 1 seed first obtained in 1945.

Description: Hardy, vigorous, moderately productive strain with good leaf disease resistance. Mid-early in maturity, fair in seed production, and quite susceptible to seed shattering. Has never been adequately tested up to 1957 to judge merits. Appears similar to commercial types from long-time stands in Iowa and Minnesota. Parental clone sources were: German Steenacker No. 1, German Rondowbrooker 18, Oregon commercial, U.S.D.A. Nos. 55,009 and 018, Minnesota Nos. J18, J15G, J15A, J20B and Iowa 503.

Released: 1946, cooperatively by Iowa Agricultural Experiment Station and the Nursery Division, SCS.

Foundation seed: Agronomy Department, Iowa Agricultural Experiment Station, Ames, Iowa.

Certified seed: Available in limited quantities.

Mandan 315

Selected at U. S. Northern Great Plains Field Station, Mandan, North Dakota -- George A. Rogler.

Source: Field collection made near Waterloo, Montana in 1936.

Method of breeding: Increase of above field collection. Planted in observational rows under dryland conditions at Mandan in 1937, it was the most vigorous and most persistent of 10 reed canarygrass accessions grown in the nursery up to 1948. Vegetative material from original rows moved to new location in 1949 still persists. Seed from latter planting placed under increase in 1956.

Description: Vigorous, tall, free of leaf spot diseases at Mandan.

Released: No, entered in grass testing program in 1957.

Breeder seed: Limited quantities available at U. S. Northern Great Plains Field Station, Mandan, North Dakota.

Superior

Selected at Oregon Agricultural Experiment Station, Corvallis, Oregon; ARS, U.S.D.A. cooperating -- H. A. Schoth.

Source: Material growing on Oregon Agricultural Experiment Station farm.

Method of breeding: Single plant selection made in 1926.

Description: Comparatively non-shattering, large seeds. Leafy, late-maturing. Adapted to highland and fairly wet areas, but not resistant to long periods of inundation.

Released: Cooperatively by the Oregon Agricultural Experiment Station and the Crops Research Division, ARS.

Breeder seed: Not available.

Certified seed: Not available. Variety has looked promising in some tests. The strain used in grazing tests at the Alabama Agricultural Experiment Station apparently traces to Superior.

Phalaris coerulescens Desf.

Sunolgrass

Increased at Soil Conservation Service Nursery, Pleasanton, California.

Source: An increase of Phalaris coerulescens P.I. 111,994. Tested at the Pleasanton Nursery since 1936, and under range conditions at Sunol, California since 1944.

Description: A rapid developing, long-lived, bunchgrass for supplemental range reseeding in the winter annual range areas which receive 16 inches or more of rainfall. Resembles hardinggrass in general appearance, but has three or more round, bulb-like enlargements at the bottom of each stem rather than the typical elongated bulb of hardinggrass.

Released: Included in testing programs.

Breeder seed: Plant Materials Center, Pleasanton, California.

Certified seed: Not available.

Phalaris tuberosa var. *stenoptera* (Hack.) Hitchc., hardinggrass.

Hardinggrass

Source: Introduced from Australia. Spontaneous in Humboldt County California. Seed collected from an old hardinggrass field on the Peters Ranch, Hopland, Lake County, California in 1940 by D. J. Vanderwal. This seed lot was given the accession number P-11740 and increased at the Plant Materials Center, SCS, U.S.D.A., Pleasanton, California.

Description: Hardinggrass is a long-lived, intermediate winter growing, persistent, dryland perennial bunchgrass. It has short, stout rhizomes originating from the base of a low lying crown and semi-broad, blue-green leaves. The forage yields are high.

Hardinggrass is adapted to select land capability units in the Mediterranean climatic zone where the average annual rainfall amounts to 16 inches or more and some moisture is available in soil profile during the hot, droughty summer and fall seasons.

Released: Certified by the California Crop Improvement Association in the fall of 1946.

Breeder seed: Plant Materials Center, SCS, U.S.D.A., Pleasanton, California. Foundation seed available from the California Crop Improvement Association.

Certified seed: Available.

Phleum pratense L., timothy.

Climax

Selected at the Central Experimental Farm, Ottawa, Ontario, Canada.

Description: Leafier and somewhat later than Cornell 1777 and 4059, and one week later in maturity than common. It has performed well in tests conducted in the Northeastern States.

Released: Canada Department of Agriculture.

Breeder seed: Central Experimental Farm, Ottawa, Canada.

Certified seed: Available from Canada in limited quantities (certified in Washington).

Cornell 1777

Selected at Cornell University, Ithaca, New York.

Description: Developed in 1908. More resistant to rust than Cornell 4059 or common timothy. Medium height, medium early, leafy, medium fine stem. Retains green color when mature. High yields of forage and seed.

Released: 1922, by the New York Agricultural Experiment Station.

Breeder seed: Not available.

Certified seed: Not available (at one time, increased for commercial production in the Pacific Northwest).

Cornell 4059

Selected at Cornell University, Ithaca, New York.

Description: One week later in maturity than common timothy. It is a tall, erect, coarse type which appeared to be adapted to the coastal area of New England.

Released: 1922, by the New York Agricultural Experiment Station.

Breeder seed: Not available.

Certified seed: Not available.

Drummond

Selected at Macdonald College, P. Q., Canada.

Source: A strain from northern Europe, S 48 and S 51 from Wales, and FC 15150 from the USDA and Ohio A. E. S., all introduced during period 1930-33.

Method of breeding: Maternal line selection, with space planted progeny tests.

Description: Drummond reaches the flowering and seed stage about 10 to 14 days later than common timothy at Macdonald College. It is winter hardy and has an appreciable amount of rust resistance.

Released: Yes, by Department of Agronomy, Macdonald College.

Breeder seed: Department of Agronomy, Macdonald College.

Certified seed: Available in limited quantities (some increase in the Pacific Northwest).

Dural

Selected at University of Manitoba, Winnipeg, Canada.

Source: Parent material obtained from Cornell University and from the Ontario Agricultural College.

Description: Selected for yield, leafiness and resistance to rust. A winter-hardy type well adapted to the more humid areas of Manitoba. Medium in maturity.

Released: University of Manitoba, Winnipeg, Canada.

Breeder seed: Same.

Certified seed: Limited.

Essex

Selected at Cornell University, Ithaca, New York -- R. P. Murphy and S. S. Atwood.

Source: Wide collection of seed lots from plant breeders in the United States.
Parental clones: N.Y. 48-30, N.Y. 48-140, N.Y. 48-154, and N.Y. 48-215.

Method of breeding: Synthetic variety developed from 4 selected clones. Breeder seed is produced in an isolated plot from randomly planted vegetative pieces of the four clones in 100 or more replications. Equal amounts of seed from each parental clone are mixed together for breeder seed. Foundation seed is the first advanced generation from breeder seed. Certified seed is the first advanced generation from foundation seed and is not eligible for use as planting stock for the production of any class of certified seed.

Description: A very late maturing leafy variety. It has yielded 97% of Common and Climax when tested alone, 94% when tested with alfalfa, and 93% when tested with Empire birdsfoot trefoil. Essex is approximately two weeks later in maturity than Common and 10 days later than Climax. The forage of Essex at the first harvest is nearly always leafier and free of foliar diseases than Common, Climax and other earlier maturing sorts. In limited tests for seed production Essex has been similar to Common and lower than Climax in yield.

Released: 1955, by the Department of Plant Breeding, Cornell University.

Breeder seed: Department of Plant Breeding, Cornell University.

Certified seed: Foundation seed from The New York Foundation Seed Stocks Cooperative, Inc., Plant Science Building, Cornell University, Ithaca, New York. Limited amounts of certified seed to be produced in 1958.

Experimental Synthetic B

Selected at Cornell University, Ithaca, New York -- R. P. Murphy and S. S. Atwood.

Source: Wide collection of seed lots from plant breeders in the United States.
Parental clones: N.Y. 48-11, N.Y. 48-56, N.Y. 48-102, N.Y. 48-103, and N.Y. 48-110.

Method of breeding: Synthetic variety developed from 5 selected clones. First and second generation seed produced as for Essex.

Description: A medium to late maturing leafy variety similar to Climax in performance except that it has wider leaves and is approximately three days later in maturity.

Released: No, to be continued under test.

Hopkins

Selected at the Ohio Agricultural Experiment Station, Wooster, Ohio; Agricultural Research Service, USDA cooperating - M. W. Evans.

Source: Collections from old meadows and roadsides.

Method of breeding: (see Marietta) composed of selections FC 28119 and FC 28152.

Description: In northern Ohio it is approximately 14 to 15 days later than common timothy.

Released: 1946, cooperatively by the Ohio Agricultural Experiment Station and the Crops Research Division, Agricultural Research Service.

Breeder seed: Clones maintained at the Indiana Agricultural Experiment Sta.

Certified seed: Not available.

Huron

Selected at North Ridgeville, Ohio, Ohio Agricultural Experiment Station; Agricultural Research Service, USDA cooperating - M. W. Evans.

Source: Plant selected along roadside about 4 1/2 miles west of Wakeman, Huron County, Ohio, in 1911.

Method of breeding: (See Marietta). Evaluated as FC 3937.

Description: A late variety, about 6 days later blooming and maturing seed than common timothy.

Released: Cooperatively by Ohio A.E.S. and Crops Research Division, ARS.

Breeder seed: Not available.

Certified seed: Not available.

Itasca

Selected at Minnesota Agricultural Experiment Station, St. Paul, Minnesota.

Source: See method of breeding.

Method of breeding: Variety is composed of seven inbred lines from the following sources: One from Minnesota commercial seed, one from T7, two from Cornell No. 1620 and three from Cornell No. 1777. The synthetic has been tested as Minn. No. 1630.

Description: Rank growing variety that is well adapted to conditions in Minnesota. Similar to commercial timothy in maturity, but superior in growth character and habit.

Released: Yes, Minnesota Agricultural Experiment Station, St. Paul, Minnesota.

Breeder seed: Minnesota Agricultural Experiment Station.

Certified seed: Very limited.

Lorain

Selected at the Ohio Agricultural Experiment Station, Wooster, Ohio; Agricultural Research Service, USDA cooperating - M. W. Evans.

Source: Collections from old meadows and roadsides.

Method of breeding: (See Marietta). Composed of selections FC 15167 and FC 28147.

Description: In northern Ohio, Lorain is approximately 10 to 12 days later than common timothy. Leaves remain green for about 8 to 10 days longer than those of common. It is adapted for hay production in northern Ohio.

Released: 1939, cooperatively by the Ohio Agricultural Experiment Station and the Crops Research Division, Agricultural Research Service.

Breeder seed: Clones maintained at Indiana Agricultural Experiment Station.

Certified seed: Not available.

Marietta

Selected at the Ohio Agricultural Experiment Station, Wooster, Ohio; Agricultural Research Service, USDA, cooperating - M.W. Evans.

Source: Collections from meadows and roadsides.

Method of breeding: Selection practiced in space-planted nurseries. Plots arranged in blocks of selections having same time of heading, blooming and maturity. Selections progeny tested in space-planted row plots in successive generations. Variety was composed of 3 selections FC 11901, 12468, and 15220. In 1946, the selections were changed to FC 11901, FC 28096, and FC 28185. The leaves of the latter two selections remain green longer than FC 12468 and FC 15220.

Description: It blooms and matures, in northern Ohio, approximately 5 days earlier than common timothy. Leaves tend to remain green nearly as late as common timothy. Marietta is well adapted to southern Ohio.

Released: 1937, cooperatively by Ohio Agricultural Experiment Station and the Crops Research Division, Agricultural Research Service.

Breeder seed: Clones maintained at Indiana Agricultural Experiment Station.

Certified seed: Not available.

Medon

Selected at the Ontario Agricultural College, Guelph, Ontario, Canada.

Source: Local collections and introductions from Scandinavia, Russia, Central Europe, Great Britain, and the United States.

Description: Leafy, winter-hardy, well adapted in Ontario.

Released: By the Ontario Agricultural College.

Certified seed: Limited.

Milton

Selected at Macdonald College, P. Q., Canada.

Source: Strain obtained from Cornell University, University of Minnesota, Svolof Experiment Station and commercial seed from the Dickinson Seed Company, Chicago in 1911.

Method of breeding: Fairly rust resistant in comparisons made with inoculated plants at Macdonald College, whereas ordinary commercial strains are susceptible to timothy rust. Winter-hardy, early-maturing, vigorous variety.

Released: Macdonald College, P. Q., Canada.

Breeder seed: Same.

Certified seed: Limited.

Shelby

A early-maturing farmer's strain grown and used in southern Indiana.

Certified seed: Not available.

Swallow

Selected at University of Alberta, Edmonton, Canada.

Source: Late Swedish stock of (Svolöf) 523 introduced into Alberta in 1918.

Description: Hay type, similar to common timothy in appearance but with good stem rust resistance (Edmonton) and winter hardiness.

Released: Department of Field Crops, University of Alberta.

Breeder seed: University of Alberta, Edmonton, Alberta.

Certified seed: Limited.

Vevay

Naturalized strain growing on farm of Mr. Clair Andrew, Vevay, Indiana. Tested at the Kentucky Agricultural Experiment Station -- R. C. Buckner.

Source: Unknown.

Description: A very early-maturing strain, relatively coarse, vigorous, with good aftermath production.

Released: No, included in regional testing program.

Breeder seed: Maintained by Mr. Andrew, Vevay, Indiana.

Certified seed: None.

Poa ampla Merr., big bluegrass.

Sherman

Selected at the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington -- V. B. Hawk, J. L. Schwendiman, and A. L. Hafenrichter.

Source: Collected from the native vegetation near Moro, Sherman County, Oregon, by D. E. Stephens, Superintendent of the Sherman Branch Experiment Station in 1932. Recollected by the SCS in 1935, and tested as P-2716 against 177 other accessions.

Method of breeding: Mass selection for several generations.

Description: Sherman starts growth very early in the spring. It is productive, early-maturing, 35-38 inches tall, erect-growing and fine-stemmed. It is a long-lived, perennial bunchgrass, high in seed, forage, and root production. It has distinct blue, moderately abundant leaves and a large, compact seed head. Plants are apomictic ($2n = 63$).

Adapted to conservation seedings alone or with alfalfa in dryland areas in wheat-fallow farmland on light textured soils. It is successfully used for reseeding burned over forest lands in the pine zones of the western states.

Released: 1945, cooperatively by the Washington, Idaho, and Oregon Agricultural Experiment Stations, and the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington. Distributed for field trials in 1938.

Breeder seed: Plant Materials Center, SCS, U.S.D.A., Pullman, Washington.

Certified seed: Available in quantity.

Poa arida Vasey, plains bluegrass.

Reno

Increased at the Plant Materials Center, Manhattan, Kansas -- M. D. Atkins.

Source: From a field seed collection made in 1951 on poorly drained, high water table, saline grassland near Hutchinson, Reno County, Kansas. Increased for testing as KG-2186.

Description: A leafy, vigorous ecotype for use in grass mixtures for establishing permanent vegetation on high water table, saline and alkaline sites in central and western Kansas. Medium seed production.

Released: Informally by SCS in 1956 for field evaluation plantings.

Breeder seed: Small foundation seed block being maintained at the Plant Materials Center, Manhattan, Kansas.

Certified seed: None available.

Poa bulbosa L., bulbous bluegrass.

P-4874

Selected at the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington -- J. L. Schwendiman.

Source: Pullman, Washington - East on Highway 3 near the Idaho State line. Collected in 1937 by J. L. Schwendiman from a naturalized stand.

Method of breeding: Bulk selections from an open-pollinated planting of the original collection. Tested against commercial and other naturalized strains.

Description: A vigorous robust, leafy, tall growing, productive, late maturing strain. A heavy forage and seed producer. Plants are short-lived perennials. It reseeds readily. Seed is high in germination. Adapted for use as an understory grass in range seedings of crested wheatgrass or other dryland grasses at elevations of less than 4,000 feet where it provides good ground cover.

Released: 1956, cooperatively by the Idaho Agricultural Experiment Station and the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington.

Breeder seed: Plant Materials Center, SCS, U.S.D.A., Pullman, Washington.

Certified seed: Available in limited quantities in 1958.

Poa pratensis L., Kentucky bluegrass.

Arboretum

Selected at Missouri Botanical Garden, St. Louis, Missouri -- W. L. Brown.

Source: Collections of plants from old pastures and lawns in Missouri and neighboring states.

Released: Informally. Has been included in a number of turf trials. This variety has not been outstanding in most tests.

Certified seed: Not available (limited commercial increase in Pacific Northwest)

Delta

Selected at Central Experimental Farm, Ottawa, Ontario, Canada.

Source: Single plant selection out of native material.

Description: Vigorous, erect, fine-stemmed, relatively early, apomictic variety. Adapted to cooler sections of Kentucky bluegrass region where leaf spot infestations to which it is susceptible are less frequent.

Released: Canada Department of Agriculture

Certified seed: Available (certified in the Pacific Northwest).

Dwarf Pacific Northwest Selections

Selected at the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington -- J. L. Schwendiman and T. R. Adlard.

Source: From Professor Frandsen, Denmark as F.C. 22,190 in 1934. Propagated as P-4358.

Method of breeding: Propagated through 4 generations to eliminate aberrant plants. Space planted in 1952 and 14 single plant selections were made in 1953. The following were outstanding.

P-4358 - 105 height 24", low spreading type, good seed producer.

P-4358 - 205 height 21", low type.

P-4358 - 402 height 20", low type, good seed producer.

P-4358 - 602 height 10", very low, dark green, poor seeder.

Seed from these plant selections was space planted. Aberrant plants were removed and the bulked seed of each selection was used for further testing in turf trials of the Agronomy Department of Washington Agricultural Experiment Station.

Description: A dwarf low growing type with short dark green leaves. Similar to Merion, but 10-14 days later in seed maturity. It produces very few aberrant plants, and is resistant to powdery mildew and leaf and stem rust.

Released: No.

Breeder seed: Plant Materials Center, SCS, U.S.D.A., and the Agronomy Department of the Washington Agricultural Experiment Station.

Certified seed: None.

KB - 143(223)

Selected at U. S. Regional Pasture Research Laboratory, University Park, Pennsylvania -- W. M. Myers.

Source: Commercial seed lot received from Kansas City, Missouri.

Method of breeding: Space planted progeny tests, and evaluation in sod plots.

Description: Very vigorous selection - consistently outyielded common lots in yield tests.

Released: No. Distributed for testing.

Breeder seed: Limited amount of seed in storage.

Selected at U. S. Regional Pasture Research Laboratory, University Park, Pennsylvania
-- W. M. Myers.

Source: O.A.C. #2, a strain supplied by Dr. Muntzing.

Method of breeding: Space planted progeny tests, and evaluation in sod plots.

Description: Low growing "lawn type".

Released: No, distributed for testing.

Merion

Selected at Plant Industry Station, Beltsville, Maryland -- Fred V. Grau.

Source: A single plant selection made by Superintendent of the Merion Golf Club, Ardmore, Pennsylvania in 1936.

Method of breeding: Plant selection and apomictic seed progenies, obtained through succeeding generations tested in cooperative turf research program of the Crops Research Division, ARS and the U. S. Golf Association, Green Section.

Description: A low growing variety characterized by high degree of resistance to Helminthosporium leafspot, short leaves and good color. More tolerant to close mowing than common Kentucky bluegrass. Susceptible to rust.

Released: Distributed in 1947 by Crops Research Division, ARS and U. S. Golf Association, Green Section.

Breeder seed: Pennsylvania State University, University Park, Pennsylvania.

Certified seed: Available in quantity.

Newport

Selected at the Plant Materials Center, SCS, U.S.D.A., Pullman, Washington --
Jens Clausen, Carnegie Institution of Washington and Plant Material Center Staff.

Source: A maritime race collected from coastal bluffs at Newport, Lincoln Co., Oregon by W. E. Lawrence. Propagated under Carnegie Institution of Washington, Stanford University accession CIW 4466-1 and accession P-13821.

Method of breeding: Seed of the original collection was used to establish a spaced planting in 1949. The strain was found apomictic ($2n = 81$) and bulked seed was used for an increase planting made in 1953. This strain was used in the Carnegie Institution of Washington hybrid bluegrass studies.

Description: A vigorous highly productive coastal race of broad climatic tolerance. It has wide dark green leaves, is low growing, fair to good in seed production, medium early in seed maturity, and rapid sod forming. Appears to be resistant to rust and Helminthosporium leaf spot.

Released: No, included in turf trials.

Breeder seed: Plant Materials Center, SCS, U.S.D.A., through Agronomy Department of the Washington Agricultural Experiment Station.

Certified seed: Not available.

Park

Selected at the Minnesota Agricultural Experiment Station, St. Paul, Minnesota - H. L. Thomas, Herman Shultz, A. R. Schmid, and H. K. Hayes.

Source: Vegetative material collected from 60 old pastures and waste places throughout Minnesota in 1937.

Method of breeding: Collections separated in 281 vigorous individual plants and carried through extensive selection and testing program until 1947. Eighteen strains selected for further testing and in 1953 a mixture of the 15 best apomictic strains were increased for testing as Minnesota 95.

Description: In Minnesota, Park is described as being superior to Merion in seedling and plant vigor, resistance to rust, and sod formation.

Released: Yes, by Minnesota Agricultural Experiment Station.

Breeder seed: Minnesota Agricultural Experiment Station.

Certified seed: Available.

Troy

Selected at the Montana Agricultural Experiment Station; ARS, U.S.D.A., cooperating -- R. E. Stitt.

Source: Increase of P.I. 119,684. Introduced from Turkey by W. L. Westover.

Description: A vigorous, pasture strain released for use in irrigated pastures in Montana. Tall, erect growth habit, good recovery, and open sod, but not outstanding with respect to disease resistance. Adapted to the cooler parts of the Kentucky bluegrass region.

Released: 1955, cooperatively by the Montana Agricultural Experiment Station and the Crops Research Division, ARS.

Breeder seed: Montana Agricultural Experiment Station.

Certified seed: Limited supply.

Setaria italica (L.) Beauv., foxtail millet.

German 8

Developed by Asgrow Texas Company, San Antonio, Texas.

Method of breeding: Head to row selection for uniformity.

Description: Uniform for leafiness and lobed heads (the lobed head character is accentuated in thin stands).

Released: 1952, Asgrow Texas Company.

Certified seed: Available.

German 8A

Developed by Asgrow Texas Company, San Antonio, Texas.

Method of breeding: Single plant selection.

Description: Superior seedling vigor, broad leaves and a few days earlier than German R.

Released: Yes, Asgrow Texas Company.

Certified seed: Available.

German Millet R

Developed by the J. R. McNeill Seed Company, Spur, Texas -- J. R. McNeill. J. R. McNeill made original selections. Increase and evaluations made jointly with A. M. Stoy, and first increase of foundation (Registered) seed was made by George C. Warner.

Source: Production field of certified German Millet near Kress, Texas.

Method of breeding: Fifty selections were planted head to row in 1948. Seven strains designated R. showed leafiness, fine stems, seedling vigor, large seed size, with maturity we considered typical of the older German Millet composite. Strain was fairly homozygous from the first planting, but was close rogued in several generations before release.

Description: German Millet R is fine stemmed, leafy, with compact heads smaller than other current varieties or strains of German Millet. Spines are red to purple in the immature head stage, and the R in the name refers to this character. Stems are slender and recurve under the weight of the heads. Seed is larger than other German Millets observed, and the typical tubercle character is confined to the base of the seed. This seed character affords a means of identifying the variety from seed, while the purple spines afford a means of identifying the variety in the field.

Breeder seed: J. R. McNeill Seed Company, Spur, Texas.

Certified seed: Available in quantity.

Sorghastrum nutans (L.) Nash, indiangrass.

Cheyenne

Bulk strain collected October, 1942 by former Woodward, Oklahoma SCS Nursery, OK-N-2. Original collection was 2½ pounds recleaned seed. Strain was increased dryland at Cheyenne, Oklahoma LU project until 1951, then placed in irrigated increase by OK-N-2 near Texline, Texas. First seed crop from this location harvested fall 1953, and distributed to soil conservation districts spring 1954. Max Bower, Morton, Texas, planted 1½ acres using this seed in 1954.

Source: Native range stand near Supply, Oklahoma.

Description: Heterogenous plant makeup. The strain may have acquired some uniformity in flowering and date of maturity through successive increase plantings of combine-harvested seed material. It is a good forage type and a good seed producer. It should be fully adapted for range and pasture seeding in western Oklahoma and most of the Texas panhandle.

Released: Informally by SCS in 1945. No commercial stands are known to exist from seed distributions made between that date and 1954, when the Bower field was established.

Breeder seed: Not applicable.

Certified seed: None, (in commercial production).

Kansas Experimental (Unnamed)

Selected at the Kansas Agricultural Experiment Station, Manhattan, Kansas

Source: Selected in 1955 from accessions collected in 1953 in native grass-lands in Oklahoma and southern Kansas and space-planted in 1954. Fifty plants were selected after two seasons of observation (1954 and 1955) in an evaluation nursery of several thousand individuals. Major criteria for selecting these were leafiness, vigor (large size), freedom from rust, and, since this species tends to mature late, earliness of maturity. These were propagated clonally in a 5-rep, randomized crossing block in 1956. Seed produced by this block in 1956 was planted in 36-inch rows in 1957 for further increase. It is planned that this may serve temporarily as a variety until plant breeders can make further improvement.

Description: Tall, leafy, vigorous, mostly free of rust, medium to late maturity.

Released: Not released.

Breeder seed: The original block of randomized, space-planted clones is being maintained as a source of seed for increase and testing and a small increase field has been established from seed harvested in 1956 from the original crossing block.

Certified seed: None

M2-10302

Selected at the SCS Nursery, Ames, Iowa -- M. E. Heath and A. I. Alcott.

Source: Bulk collection of seed made along railroad right-of-way south of Ames, Iowa in 1939.

Method of breeding: Seed collected in 1939 was increased under isolation for several generations at the SCS Nursery, Ames and Ankeny, Iowa.

Description: Representative ecotype of central Iowa. Uniform, vigorous type with high seed yields.

Released: No. Tested in observational plantings by SCS from 1941-49.

Breeder seed: Small quantity maintained by SCS Plant Materials Center at Elsberry, Missouri.

Certified seed: Not available.

Sorghum halepense (L.) Pers., johnsongrass.

Mississippi Fine-stem

Selected at the Mississippi Agricultural Experiment Station, State College, Mississippi; ARS, U.S.D.A., cooperating -- Hugh W. Bennett.

Source: Large number of field collections.

Method of breeding: Selection made on number of culms produced from seed first season (above 60), further selection made on degree of clipping and palatability.

Description: Produces 130-180 culms per plant from 2-4 feet tall and 1/32 to 2/16 inch in diameter. Largest culm never gets as large as minimum allowed in #1 hay. Very leafy.

Released: No. Included in some regional tests. Low seed set and probably should be dropped.

Breeder seed: Maintained at Mississippi Agricultural Experiment Station, State College, Mississippi. Used in breeding program.

Mississippi Persistent

Selected at the Mississippi Agricultural Experiment Station, State College, Mississippi; ARS, U.S.D.A., cooperating -- Hugh W. Bennett.

Source: Large number of field collections.

Method of breeding: Selection made on number of culms produced from seed first season (above 60), further selection made on degree of clipping and palatability.

Description: Produces 80-120 culms per plant up to 5 feet tall and 2/16 to 4/16 inch in diameter. Rather compact base with very slowly spreading rhizomes. Persistent under mowing, and has withstood six clippings for 2 years. The only self-fertile plant in large number handled.

Released: No, included in regional testing program.

Breeder seed: Maintained at the Mississippi Agricultural Experiment Station, State College, Mississippi.

Sorghum halepense x Sorghum vulgare and Sorghum halepense x Sorghum sudanense, sorghass

Miss. ISJ

Selected at the Mississippi Agricultural Experiment Station, State College, Mississippi; ARS, U.S.D.A., cooperating -- Hugh W. Bennett.

Source: Collections of Hodo sorgo and johnsongrass.

Method of breeding: The cross was made by pollinating hot water (42° C for 10 minutes) emasculated Hodo sorgo florets with a red-stigma johnsongrass. Selfing was started in the F₁ and has been continued. Spaced F₂ plants were left where set for growth habit studies. The perennial (75 percent) plants were grazed by cattle. The cattle consistently grazed the types containing juice regardless of stem size. The 5 percent of the selectively grazed population were selfed and progeny selected for juiciness by hand twisting and for non-spreading rhizomes.

Description: ISJ is a selection from the F₆ made on the basis of plant size intermediate between sorgo and johnsongrass. Produces 20-40 culms per plant which are 9-12 feet tall and are 1/3 to 1/2 inch in diameter. These arise from very slowly spreading rhizomes. Produces two cuttings per year. Total carbohydrate content of 10-14 percent. Seed set is approximately 50 percent. Produces extremely well under irrigation and fertilization.

Released: No, included in regional testing program.

Breeder seed: Maintained at Mississippi Agricultural Experiment Station at State College, Mississippi.

Miss. SJ-1

Selected at the Mississippi Agricultural Experiment Station, State College, Mississippi; ARS, U.S.D.A., cooperating -- Hugh W. Bennett.

Source: Collection of Hodo sorgo and johnsongrass.

Method of breeding: The cross was made by pollinating hot water (42° C for 10 minutes) emasculated Hodo sorgo florets with a red-stigma johnsongrass. Selfing was started in the F_1 and has been continued. Spaced F_2 plants were left where set for growth habit studies. The perennial (75 percent) plants were grazed by cattle. The cattle consistently grazed the types containing juice regardless of stem size. The five percent of the selectively grazed population were selfed and progeny selected for juiciness by hand twisting a culm 180 degrees. Later juicy progeny were further selected for non-spreading rhizomes.

Description: SJ-1 is an F_6 segregate and selection was made on the basis of large leaves and sweet stems. Produces 25-65 culms per plant which are 3-1/2 to 7 feet tall 3/16 to 7/16 inch in diameter. Too large and juicy for hay but makes good grazing and a leafy silage. Seed production is extremely low. May be cut at least twice per season.

Released: No, included in regional testing program. Dropped because of low seed production. Used in new hybrids and backcrosses.

Breeder seed: Clones maintained at Mississippi Agricultural Experiment Station, State College, Mississippi.

Miss. -SJ-2

Selected at the Mississippi Agricultural Experiment Station, State College, Mississippi; ARS, U.S.D.A., cooperating -- Hugh W. Bennett.

Source: Collection of Hodo sorgo and johnsongrass.

Method of breeding: The cross was made by pollinating hot water (42° C for 10 minutes) emasculated Hodo sorgo florets with a red-stigma johnsongrass. Selfing was started in the F_1 and has been continued. Spaced F_2 plants were left where set for growth habit studies. The perennial (75 percent) plants were grazed by cattle. The cattle consistently grazed the types containing juice regardless of stem size. The 5 percent of the selectively grazed population were selfed and progeny selected for juiciness by hand twisting and for non-spreading rhizomes.

Description: SJ-2 is a selection from the F_6 made on the basis of grass type habit and carbohydrate content. Very leafy and with 14 percent total carbohydrate content in a 50 percent dry matter plant. Produces 40-90 culms per plant which are 3 to 5 feet tall and 1/16 to 5/16 inch in diameter. Self-fertile and a good seed producer. May be cut at least twice per season.

Released: No, included in regional testing program. Used in dairy grazing trials in Mississippi.

Breeder seed: Maintained at Mississippi Agricultural Experiment Station, State College, Mississippi.

Perennial sweet

Selected at the Texas Agricultural Experiment Station (Substation No. 8) Lubbock, Texas - R. E. Karper.

Source: In 1941, L. F. Randolph of Cornell University, doubled the chromosome number of common sudangrass with colchicine, and crossed this tetraploid with johnsongrass. Seed of this hybrid was sent to the Texas Agricultural Experiment Station for further study.

Method of breeding: Progeny selections were grown for several years but they appeared too early and unproductive. A few selections retained this seed well, and these persistent types were grown in 1945 surrounded by sweet sudangrass. Three natural outcrosses with sweet sudangrass were recovered in 1946. Selection continued for sweet juicy stalks, good fertility, seed yield and a perennial rooting habit intermediate between johnsongrass and sudangrass.

Description: A synthetic tetraploid ($4N$) that would be expected to cross freely with johnsongrass, but not likely to cross with other sorghums. Rootstalks short and thick, more weakly perennial and not as difficult to eradicate as johnsongrass. More likely to be profitable when handled as an annual. As palatable as sweet sudangrass. Seed similar to sweet sudangrass and glumes are predominantly chocolate or mahogany in color. Plant color mostly tan. Seeds are persistent.

Released: 1957, by Texas Agricultural Experiment Station.

Breeder seed: Substation No. 8, Lubbock, Texas.

Certified seed: Available in 1959.

Sorghum alnum

Introduced into the United States from Argentina, South Africa, Australia and New Zealand. It has been grown at the Chillicothe and Lubbock Experiment Stations since the mid-40's, and a collection from Argentina was received by the Georgia Agricultural Experiment Station in 1949. The major source of seed in the United States traces to seed lots obtained from Australia and New Zealand in 1952. It is commonly referred to as Columbusgrass in South Africa.

Source: Sorghum alnum was first described by Lorenzo R. Parodi in 1943. He received seed in 1936 from A. Ragoneese, an agronomist in the Province of Santa Fe. Parodi concluded that the grass must have originated under cultivation as a hybrid between johnsongrass (S. halepense) and some other introduced sorghum (S. vulgare). The chromosome number is $2n=40$. Records indicate that material grown in South Africa, Australia and the United States, traces to seed lots that had their origin in Argentina.

Description: A tall, robust grass, rather closely resembling johnsongrass in many ways. It has coarser, larger stems, often wider leaves, and generally grows taller than johnsongrass. The heads are longer, lax and more spreading, with more branches at a whorl. Rhizomes are stout, short and turn up close to the crown. No difficulty has been experienced in killing it out by plowing. Seed shatters very readily, and although the seed is somewhat larger than that of johnsongrass it is difficult to identify seed in the intermediate range. Some crossing could be expected to occur with johnsongrass. Sorghum alnum accessions exhibit a wide range in plant type, and some lots are more uniform than others. Prussic acid potential has been equivalent, for the most part, to that of johnsongrass.

Certified seed: Sorghum alnum is not certified, but ample supplies of commercial seed are available.

Sorghum sudanense (Piper) Stapf, sudangrass.

Beltsville Syn. No. 4

Selected at the Plant Industry Station, Beltsville, Maryland - J. P. Trimble,

Source: Disease resistant lines isolated by C. L. Lefebvre.

Method of breeding: A first generation chance-hybrid, based on 4 inbred lines.

Description: A coarse, vigorous, high yielding strain, with a good level of disease tolerance. Hydrocyanic acid content high.

Released: No, included in regional tests for 3 years.

Breeder seed: Not available, lines used in several breeding programs.

California 23

Selected at the Imperial Valley Experiment Station, El Centro, California --
L. G. Goar.

Source: Common sudangrass.

Method of breeding: Selected from common sudangrass in the early 1930's; reselected
at Davis, California, to eliminate black seed and other off-types.

Description: A little later in heading and more uniform than common sudangrass.
It has shown a somewhat taller and more vigorous growth and has yielded 10 to 20
percent more than common or Sweet sudangrass at the California Agricultural
Experiment Station. It is susceptible to leaf diseases when grown under humid
conditions.

Released: 1938, by California Agricultural Experiment Station.

Breeder seed: California Agricultural Experiment Station, Davis, California.

Certified seed: Available.

Common

Introduced into the United States in 1909.

Source: Probably a native of upper Egypt and it is cultivated near Khartum
under the name "garawi", but it may have originated farther south in Africa.

Description: Several strains of sudangrass were developed from early introduc-
tions. They are similar in type, being extremely early and susceptible
to disease.

Released: Informally by U.S.D.A. and State Experiment Stations in early 1900's.

Certified seed: Some local strains are certified (ample commercial supplies).

Georgia 337

Selected at the Georgia Coastal Plain Experiment Station, Tifton, Georgia;
ARS, U.S.D.A., cooperating -- Glenn W. Burton.

Source: Developed from intercrossing and selection of material tracing its
parentage to Tift sudangrass, McLean sorghum, and low HCN lines from the
University of Wisconsin.

Method of breeding: The disease resistance of Tift and the low HCN of the
Wisconsin material was combined by hybridization and screening F₂ populations.
This material was crossed with McLean sorghum for broad leaves, extra disease
resistance, juiciness and sweet stalk. Selected F₂'s were recombined several
times to bring together desired characteristics. Usually 1,000 or more F₂'s
were tested in the F₃ generation in single-row plots between rows of common and
Tift. Finally, an F₂ plant breeding true for the desired traits in the F₃ was
increased in isolation.

Description: Georgia 337 has excellent disease resistance, sweet juicy stalks,
wide leaves, and low HCN. It also has a uniform straw-colored seed coat.
It is late-maturing and often outyields other varieties during long growing
seasons. It has shown great yield potential under irrigation. Its disease
resistance gives it dependability and quality lacking in some varieties during
heavy disease epidemics.

Released: No. Included in regional grass testing program.

Breeder seed: Georgia Coastal Plain Experiment Station, Tifton, Georgia.

Greenleaf

Selected at the Kansas Agricultural Experiment Station, Manhattan, Kansas -- R. C. Pickett.

Source: An advance generation backcross of common sudangrass x Leoti Red sorghum received in 1940 from the Texas Agricultural Experiment Station. After several generations of selection, a composite group of selected lines was bulked for increase in 1951.

Method of breeding: Selection for a number of generations in a sudangrass x Sweet sorghum cross.

Description: Juicy stalked, tall, fairly coarse, vigorous, leafy, freely tillering, late maturing, with tan glume color (from the Leoti parent), a high degree of resistance to leaf diseases, and high forage yields.

Released: 1953, by the Kansas Agricultural Experiment Station.

Breeder seed: None.

Certified seed: Available in quantity.

Lahoma

Selected at the Oklahoma Agricultural Experiment Station, Stillwater, Oklahoma -- W. C. Elder.

Source: Breeding materials received from Texas Agricultural Experiment Station in 1948.

Method of breeding: Selected from progeny row that remained in vigorous growing condition after the other entries had succumbed to drought and severe chinchbug infestation. Distributed for testing as Oklahoma No. 130.

Description: A wide-leaved, late-maturing, drought-enduring variety. It is very uniform in growth habit, tillers well, and has a distinctive yellow-green leaf color. A good seed producer and seeds range in color from apricot to sienna. Leaf diseases may be troublesome when moisture is excessive. No more prussic acid than other sweet types.

Released: 1954, by the Oklahoma Agricultural Experiment Station.

Breeder seed: Oklahoma Agricultural Experiment Station, Stillwater, Oklahoma.

Certified seed: Available.

Oklahoma No. 8

"
Selected at the Oklahoma Agricultural Experiment Station, Stillwater, Oklahoma - C. E. Denman

Source: F₂ population of Piper x Lahoma.

Description: A common type that is rather juicy and intermediate between the two parents in leafiness, maturity and tillering. Disease reaction similar to Lahoma. Seed color sienna; leaves as wide as Lahoma.

Released: No, increased for testing.

Breeder seed: Oklahoma Agricultural Experiment Station.

Piper

Selected at the Wisconsin Agricultural Experiment Station, Madison, Wisconsin-D. C. Smith.

Source: Tift and lines obtained from the Texas and Kansas Agr. Exp. Stations.

Method of breeding: Resulted from a series of crosses among lines low in hydrocyanic acid, Tift and a Texas selection, followed by repeated testing and selection. The last cross was made in 1942.

Description: Piper is low in prussic acid potential, vigorous, and resistant to leaf blight and anthracnose at northern locations. It is mixed as to seed color, with both light and dark colored seeds. It is an early variety and most of the stalks are dry.

Released: 1950, by the Wisconsin Agricultural Experiment Station.

Breeder seed: Wisconsin Agricultural Experiment Station, Madison, Wisconsin.

Certified seed: Available in quantity.

Stoneville selection

Selected at the Delta Branch Experiment Station, Stoneville, Mississippi; ARS, U.S.D.A., cooperating -- H. W. Johnson and P. G. Hogg.

Source: A sudangrass x sorghum selection resistant to Helminthosporium turcicum, seed obtained in 1947 from C. L. Lefebvre, Beltsville, Maryland, and a sorgo introduction from Africa (Mn 1054) resistant to zonate leafspot (Gleocercospora sorghi) and rust (Puccinia purpurea), seed obtained in 1950 from O. H. Coleman, Meridian, Mississippi.

Method of breeding: The cross was made in the greenhouse at Stoneville, Mississippi in the winter of 1951 and the F₁ was grown in the field that year. Selfing was started in the F₂ generation and has been continued since.

Description: Stoneville Selection is an increase of the open-pollinated seed of an F₄ line from the above cross. The seed of this selection was produced in an isolated block at Stoneville, Mississippi in 1956. The selection remains green in field plantings until late summer when it may become spotted with gray leafspot (Cercospora sorghi). Plant size is intermediate between sudangrass and sorgo. It has a high yield potential and the juice is sweet.

Released: No. Included in regional testing program.

Breeder seed: Maintained at Stoneville, Mississippi.

Stoneville Synthetic No. 1

Selected at the Delta Branch Experiment Station, Stoneville, Mississippi; ARS, U.S.D.A., cooperating -- H. W. Johnson and P. G. Hogg.

Source: A sudangrass x sorghum selection resistant to Helminthosporium turcicum, seed obtained in 1947 from C. L. Lefebvre, Beltsville, Maryland, and a sorgo introduction from Africa (Mn 1054) resistant to zonate leafspot (Gleocercospora sorghi) and rust (Puccinea purpurea), seed obtained in 1950 from O. H. Coleman, Meridian, Mississippi.

Method of breeding: The cross was made in the greenhouse at the Delta Branch Experiment Station in the winter of 1951 and the F₁ was grown in the field that year. Selfing was started in the F₂ generation and has been continued since.

Description: Stoneville Syn. 1 is an increase of the mixed, open-pollinated seed of two F_4 lines from the above cross. The seed of this synthetic was produced in an isolated block at Stoneville, Mississippi in 1956. The synthetic remains green in field plantings until late summer when it may become spotted with gray leafspot (*Cercospora sorghi*). The plant size is intermediate between sudangrass and sorgo. It has a high yield potential and the juice is sweet.

Released: No, included in regional testing program.

Breeder seed: Maintained at Stoneville, Mississippi.

Sweet (Texas SA372)

Selected at Texas Substation No. 12 Chillicothe, Texas; ARS, U.S.D.A. cooperating -- J. R. Quinby, R. E. Karper and J. C. Stephens.

Method of breeding: A mixture of strains selected from intercrosses between strains selected from a cross between sudangrass and Leoti sorghum. The selected strains were all unusually palatable to cattle.

Description: Similar to common sudangrass except that the stems are juicy and sweet and the glumes are sienna in color. Plants grow 3 to 8 feet tall and tiller freely. Stems are less than 1/2 inch in diameter and the leaves are long and narrow. Forage yield is slightly above that of common sudangrass but the increase in weight is due to higher seed production.

Released: 1943, cooperatively by the Texas Agricultural Experiment Station and the Crops Research Division, ARS.

Breeder seed: Texas Substation No. 12 and Foundation Seed Division, Agronomy Department, College Station, Texas.

Certified seed: Available in quantity.

Sweet #372(S1)

Developed by the J. R. McNeill Seed Company, Spur, Texas -- J. R. McNeill.

Source: Single plant selection from field of Registered Sweet sudangrass #372.

Method of breeding: Seed of this and other plant selections were planted in isolated blocks on dryland having good underground moisture. Only two of these selections seemed superior, and only that designated S1 (selection 1) was increased.

Description: Sweet sudangrass #372(S1) is a single strain selection from #372, a synthetic composed of multiple strains. Plants are fine stemmed, free tillering, with peduncles that recurve under the weight of heads. Seed is covered by dense sienna glumes that are glabrous and glossy. Seedling vigor is good, and maturity is 3-5 days earlier than the average of Sweet sudangrass #372 in the high plains area of Texas.

Released: Distributed by J. R. McNeill Seed Company.

Breeder seed: Maintained by J. R. McNeill, Spur, Texas.

Certified seed: Available in quantity.

Tift

Selected at the Georgia Coastal Plain Experiment Station, Tifton, Georgia; ARS, U.S.D.A., cooperating -- Glenn W. Burton.

Source: Developed from a hybridization program involving common sudangrass and Leoti sorghum.

Method of breeding: Disease resistant plants in some 35,000 F₂'s of a cross between common sudangrass and Leoti sorghum were backcrossed to sudangrass. thirty thousand F₂'s from these backcrosses gave a superior individual that bred true for disease resistance and was uniform enough in other characteristics to permit its increase in isolation and its release as Tift.

Description: Tift has a mixture of chocolate and tan-colored seeds, has the basic tan plant color, and is fine-stemmed and leafy. It is resistant to *Colletotrichum graminicolum*, *Helminthosporium turcicum*, bacterial stripe, and bacterial streak. It is somewhat later--maturing than other sudangrass varieties. During heavy disease epidemics, it produces more forage of higher quality for a longer period of time than disease-susceptible varieties.

Released: 1943, cooperatively by the Georgia Coastal Plain Experiment Station, and the Crops Research Division, ARS.

Breeder seed: Georgia Coastal Plain Experiment Station, Tifton, Georgia.

Certified seed: Available in quantity.

Wheeler

Selected by Carl Wheeler, Bridgeport, Kansas.

Source: Seed received from USDA in about 1911.

Description: An early strain of common sudangrass. It is, in general, taller and higher yielding than most common strains. It is not very leafy and is susceptible to disease. Hydrocyanic acid potential is comparable to common types.

Released: 1915, by Carl Wheeler.

Breeder seed: Not available.

Certified seed: Available in quantity.

Wild sudangrass

Source: Seed collected by Paul Tabor in 1945 from a naturalized stand at Clewiston, Florida. Tested as number SC 20-833. *Sorghum* sp.

Description: An annual grass similar to sudangrass in appearance; seed shatter soon after maturity, remain sound for some time, and volunteer freely; extensively naturalized in the Everglades area just south of Lake Okeechobee in Florida. Susceptible to leaf and stem diseases; resistant to drought.

Release: After observational evaluation, seed distributed by SCS Nursery, Thorsby, Alabama, during the spring of 1950.

Breeder seed: None.

Certified seed: None.

Seed for trial being produced at Plant Center (Nursery) Americus, Georgia, John D. Powell, Superintendent.

Sorghum vulgare var. *drummondii* (Nees) Hack. ex Chiov., chicken corn.

Chicken corn

Source: Seed collected near Eppes, Alabama by W. C. Young, August 1939 from a naturalized stand. This species was introduced apparently by accident in the Black Belt of Alabama about 1860, and became widespread a few years later. Now it has practically disappeared as a naturalized plant. Tested as number SC 26-104.

Description: A wild sweet sorghum of medium size, bearing seed that shatter soon after maturity, remaining sound over winter and germinating the following spring and summer.

Released: Seed distributed from SCS Nursery, Thorsby, Alabama during the spring of 1950 after observational evaluation.

Breeder seed: None.

Certified seed: None.

A limited amount of commercial seed is offered.

Several SCS cooperators are saving seed for wildlife plantings on their own farms.

Seed for trial being produced at Plant Center (Nursery) Americus, Georgia, John D. Powell, Superintendent.

Stenotaphrum secundatum (Walt.) Kuntze, St. Augustinegrass.

Bitter Blue

Selected originally from Florida Lower East Coast.

Source: An improved variety of St. Augustinegrass originally selected by a tradesman of grasses from the lower east coast of Florida. Stories are conflicting as to just who selected the variety and as to the original source. The variety has been known and widely used in commerce in Florida for over 25 years. However, in recent years, brisk demands for St. Augustinegrass sod has brought about widespread misuse of the name and mis-identity of the improved variety with common and pasture type St. Augustinegrass. Selections from several sources are under test at the Florida Agricultural Experiment Station Turfgrass Testing Nursery at Gainesville.

Method of breeding: Not known but surmised to be a natural selection.

Description: An improved St. Augustinegrass variety with closer internodes, shorter, more narrow leaves, greater leaf density and a closer growing habit than the common type. It is further characterized by an attractive blue-green color, good shade tolerance and frost resistance. Like other St. Augustinegrass, it does not tolerate continuous traffic, or wear, and hence is best adapted for ornamental turf.

Released: Never officially.

Breeder or Foundation material: None.

Stipa hyalina Nees

T-20,258

Increased at former San Antonio SCS Nursery TX-N-1 -- James E. Smith, Jr.

Source: Introduced from Pergamino, Argentina as PI 197,867 - BN-7440. Tested as T-20,258.

Method of breeding: Not applicable.

Description: *Stipa hyalina* is a leafy perennial bunchgrass with light green foliage. It is a heavy seed producer with stems about 30 inches tall under dryland cultivation -- often five to six feet tall under irrigation -- at seed maturity. Plants continue active growth longer in the spring than does native *S. leucotricha*. The seed is small -- about 3/16 inch long -- with a blunt callus and a very slender awn about 1 1/4 inches long. The grass volunteers aggressively against such competition as irrigated blue buffel and johnsongrass.

Released: No. Included in observational plantings.

Breeder seed: Maintained at Plant Materials Center, San Antonio, Texas.

Certified seed: Not certified.

Stipa viridula Trin., green needlegrass.

Green stipagrass

Selected at U. S. Northern Great Plains Field Station, Mandan, North Dakota -- George A. Rogler.

Source: Collection made near Mandan, North Dakota in 1935.

Method of breeding: Single plant selection from above source, progeny tested, increased, and distributed as Mandan 397.

Description: Superior to common green needlegrass in forage and seed yields, improved seedling and regrowth characteristics.

Released: 1946, cooperatively by the North Dakota Agricultural Experiment Station, and the Crops Research Division, ARS.

Breeder seed: U. S. Northern Great Plains Field Station, Mandan, North Dakota.

Certified seed: Available in quantity.

Stipa viridula x *Oryzopsis hymenoides*

Mandan ricegrass

Developed at U. S. Northern Great Plains Field Station, Mandan, North Dakota -- George A. Rogler.

Source: Amphidiploid of a natural cross of *Stipa viridula* and *Oryzopsis hymenoides*; F₁ hybrid occurred in nursery at Mandan in 1941, fertile F₂ plant found in 1945.

Method of breeding: Natural intergeneric hybridization followed by spontaneous chromosome doubling.

Description: Morphologically intermediate between the two parent species, with growth habit more closely approaching that of *Oryzopsis hymenoides*.

Released: No, distributed to experiment stations for testing.

Breeder seed: U. S. Northern Great Plains Field Station, Mandan, North Dakota.

Certified seed: Not available.

Zoysia japonica Steud., Korean lawngrass.

Meyer

Selected at the Arlington Farm, Agricultural Research Service, U.S.D.A.; U.S.G.A., Green Section, cooperating -- Ian Forbes and Marvin H. Ferguson.

Source: Japanese lawn grass (Zoysia japonica) seed introduced in 1930 from Northern Korea. Zoysia japonica is known to have been in the United States in 1895.

Method of breeding: A promising individual plant selected at Arlington in 1940. Vegetative material was moved to Beltsville, Maryland, in 1941, and increased for testing as Z-52 in 1947-48.

Description: Meyer develops a tough, wear resistant turf. Leaf width is intermediate between that of Z. matrella and Z. japonica. It is drought resistant but will turn brown during long dry periods. It grows and persists on relatively poor soils. Rate of spread and color are improved by applications of fertilizer and irrigation. It competes very satisfactorily with weeds and other grasses in areas where it is adapted. Competition from other species increases the time required to attain complete coverage. Meyer is a winter hardy variety, but in general is only recommended in those areas that have a long, warm growing season. It is a warm season grass that becomes dormant and brown with the first frost in the fall.

Released: 1951, cooperatively by the Crops Research Division, A.R.S., and the U.S.G.A., Green Section. The name Meyer honors the memory of Frank N. Meyer, a U.S.D.A. plant explorer.

Breeder sod: Plant Industry Station, Beltsville, Maryland.

Certified sod: Available.

Zoysia japonica x Z. tenuifolia Willd.

Emerald

Selected at Plant Industry Station, Beltsville, Maryland -- Ian Forbes, Jr.

Source: Emerald was selected from a number of F₁ hybrids between Z. matrella varieties japonica and tenuifolia. The japonica parent was introduced from Korea and the tenuifolia parent from the Agricultural Experiment Station at Guam.

Method of breeding: Hybrids were made in all possible combinations between varieties japonica, matrella, and tenuifolia. Selection in the F₁ was based on turf quality (leaf width, density, color, growth habit) and winterhardiness. Tested as experimental number 34-35.

Description: Emerald is a vegetatively propagated F₁ hybrid (Z. matrella var. japonica x Z. matrella var. tenuifolia). In comparison with varieties japonica, matrella, tenuifolia, and Meyer zoysia at Beltsville, Maryland, and Tifton, Georgia, Emerald had the best total turf quality score at both locations for three years. Emerald combined to varying degrees the greater winterhardiness, non-fluffy growth habit and fastest rate of spread of its japonica parent with the finer leaves, denser turf and dark green color of its tenuifolia parent. It exhibited hybrid vigor in the rate of spread, the browning and density ratings. This grass is considerably more shade and frost tolerant than bermudagrass.

Released: 1953, cooperatively by the University of Georgia, the Crops Research Division, ARS, and the U.S.G.A. Green Section.

Breeder stock: Georgia Coastal Plain Experiment Station, Tifton, Georgia.

Certified stock: Available in quantity.

Zoysia matrella (L.) Merr., manilagrass.

- Zoysia matrella (P.I. No. 13521)

Source: USDA Dr. H. N. Vinall. Sent to Alabama Agricultural Experiment Station in 1927.

Description: A perennial, fine leaved, dark green grass, leaf blades are usually 3-5 inches long when not mown, grows very dense, produces creeping stolons which root profusely, the ends of the stolons cling to the ground thus grow under competing plants. Stands considerable shade, produces seed heads and some seed in the spring, has been quite free from diseases and insects. It is susceptible to drought but will recover rapidly when moisture becomes available.

Release: After testing in Alabama it was released to nurserymen and home owners for use on lawns in Alabama. Since its release it has become one of the most important lawn grasses in Alabama and has spread from Alabama to other States.

Foundation Material: Available at the Alabama Agricultural Experiment Station. Auburn, Alabama.

Certified sod: Available.

